

NREL's Renewable Energy Finance Tracking Initiative (REFTI)



Q2 2010 Summary

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November 10, 2010

Housekeeping

- Webinar: Got audio?
 - Call-in number: **888-469-1051**
 - participant access code: **6794941**
- Presentation, webinar recording, and original aggregated spreadsheet data will be made available at NREL's new RE Finance website:

<http://financere.nrel.gov/>

- **Gain early access to future REFTI results!**
 - Complete REFTI questionnaire
 - Provide email address when prompted (for internal-use only)

Aggregated REFTI Data Now Available!

Q110_REFTI Summary and Graphics_21June10_External.xlsx - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

A1 NREL's Renewable Energy Financing Tracking Initiative (REFTI)

NREL's Renewable Energy Financing Tracking Initiative (REFTI)
First Quarter 2010

| | Headings | Formulas | Inputs |
|--|----------|----------|--------|
| | | | |
| | | | |
| | | | |

Regarding project EQUITY CAPITAL (based on after-tax returns), please tell us how your projects are generally structured...

Consolidated Graphing Info: Ratio of Tax-Investor Equity / Total Capital

| Answer Options | 0 - 9.9% | 10 - 29.9% | 30 - 50.0% | 50.1 - 69.9% | 70 - 89.9% | 90 - 100% | Response Count |
|----------------|----------|------------|------------|--------------|------------|-----------|----------------|
| Wind | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| PV < 1 MW | 1 | 2 | 2 | 0 | 0 | 2 | 7 |
| PV >= 1 MW | 3 | 1 | 2 | 0 | 1 | 2 | 9 |
| Other | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Totals | 4 | 4 | 5 | 1 | 1 | 5 | 20 |

Consolidated Graphing Info: Expected Return on Tax-Investor Equity

| Answer Options | 0.0 - 6.5% | 6.5 - 8.5% | 8.5 - 10.5% | 10.5 - 12.5% | 12.5 - 14.5% | 14.5 - 16.5% | 16.5% - 18.5% |
|----------------|------------|------------|-------------|--------------|--------------|--------------|---------------|
| Wind | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| PV < 1 MW | 0 | 0 | 0 | 1 | 0 | 4 | 0 |
| PV >= 1 MW | 2 | 1 | 0 | 1 | 1 | 2 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 2 | 1 | 0 | 2 | 2 | 7 | 0 |

Consolidated Graphing Info: Ratio of Developer Equity / Total Capital

| Answer Options | 0 - 9.9% | 10 - 29.9% | 30 - 50.0% | 50.1 - 69.9% | 70 - 89.9% | 90 - 100% | Response Count |
|----------------|----------|------------|------------|--------------|------------|-----------|----------------|
| Wind | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| PV < 1 MW | 1 | 2 | 2 | 0 | 0 | 2 | 7 |
| PV >= 1 MW | 3 | 1 | 2 | 0 | 1 | 2 | 9 |
| Other | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Totals | 4 | 4 | 5 | 1 | 1 | 5 | 20 |

Q11 - Equity Capital Q11, F1 - Share of Total Equity Q11, F2 - Tax Eq. to Total Eq. Q11, F3 - Tax Eq. to T

Ready Count: 8 120%

Webinar Agenda

- Intro to REFTI Program
 - Background/Vision
- Q2 2010 Questionnaire Results
 - Will generally follow REFTI questionnaire progression
 - Trend across multiple quarters
 - Technology Breakout
- Interactive Polling
- Question & Answer
 - Submit via internet conference and we will respond at the end

REFTI Background/Vision

- Designed to obtain quality data from RE participants
- Provides valuable insight into RE financing terms and the application of government incentives
- Four Quarters of information are now available
- With continued participation, it will be possible to observe market trends and policy implications

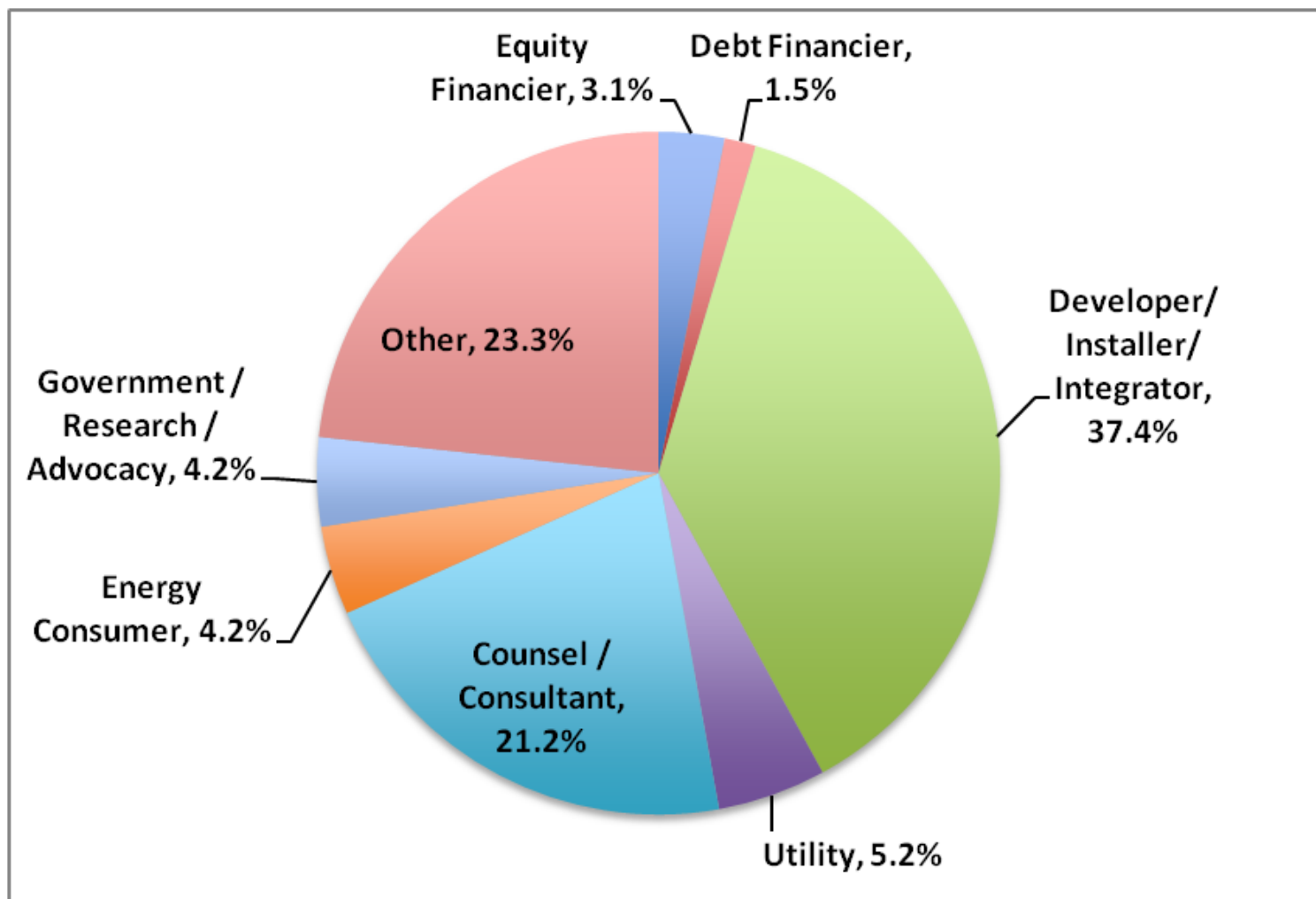
Caveats

- This is a summary of data as reported by REFTI participants
- In general, data provided was not validated by NREL
- Potential concerns:
 - Duplicate data
 - Definition of “financial closure”
 - Small sample size

Table of Contents

- REFTI participants & their project portfolios & investments
- Behind the meter projects – end-user & economic return
- Financial structure and form of incentive and depreciation taken
- REC and PPA contract terms
- Tax and Developer Equity ratios and exp. returns
- Term debt
- Installed and levelized costs

Participation: Q2'10 Firm Composition



188 people entered the questionnaire; 154 left contact info.
Developers represented largest segment with 38%

REFTI Questionnaire: Page 2, Q1 (Q3)

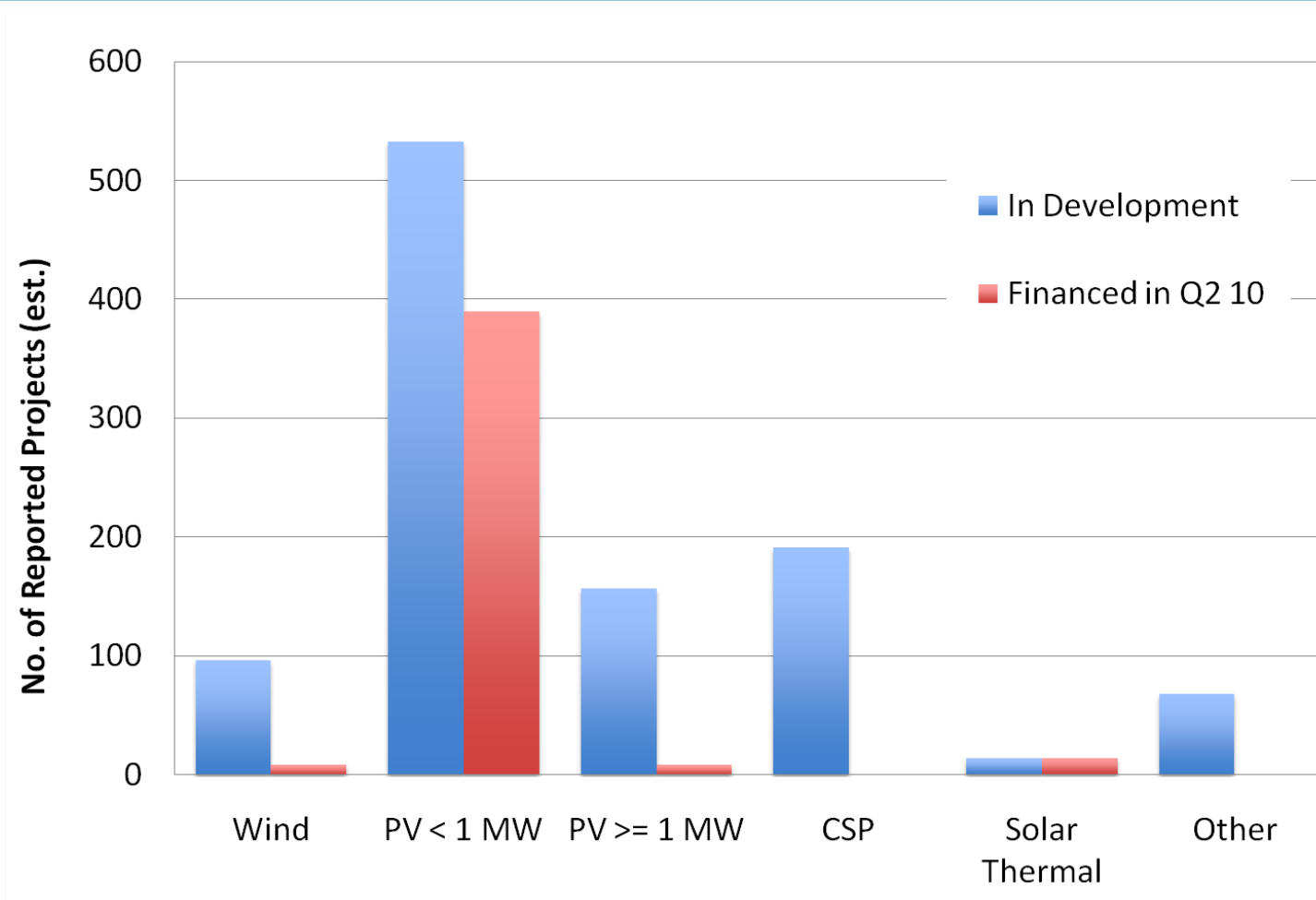
1. Please tell us about your projects **IN DEVELOPMENT** and those that **CLOSED FINANCING** in Q2 2010...

| | No. of Projects in Development | Aggregate Capacity in Development (gross MW) | No. of Projects Financially Closed (Q1 10) | Aggregate Capacity Financially Closed (gross MW) | Form of Financial Closure |
|--------------------------|--------------------------------|--|--|--|---------------------------|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Comments

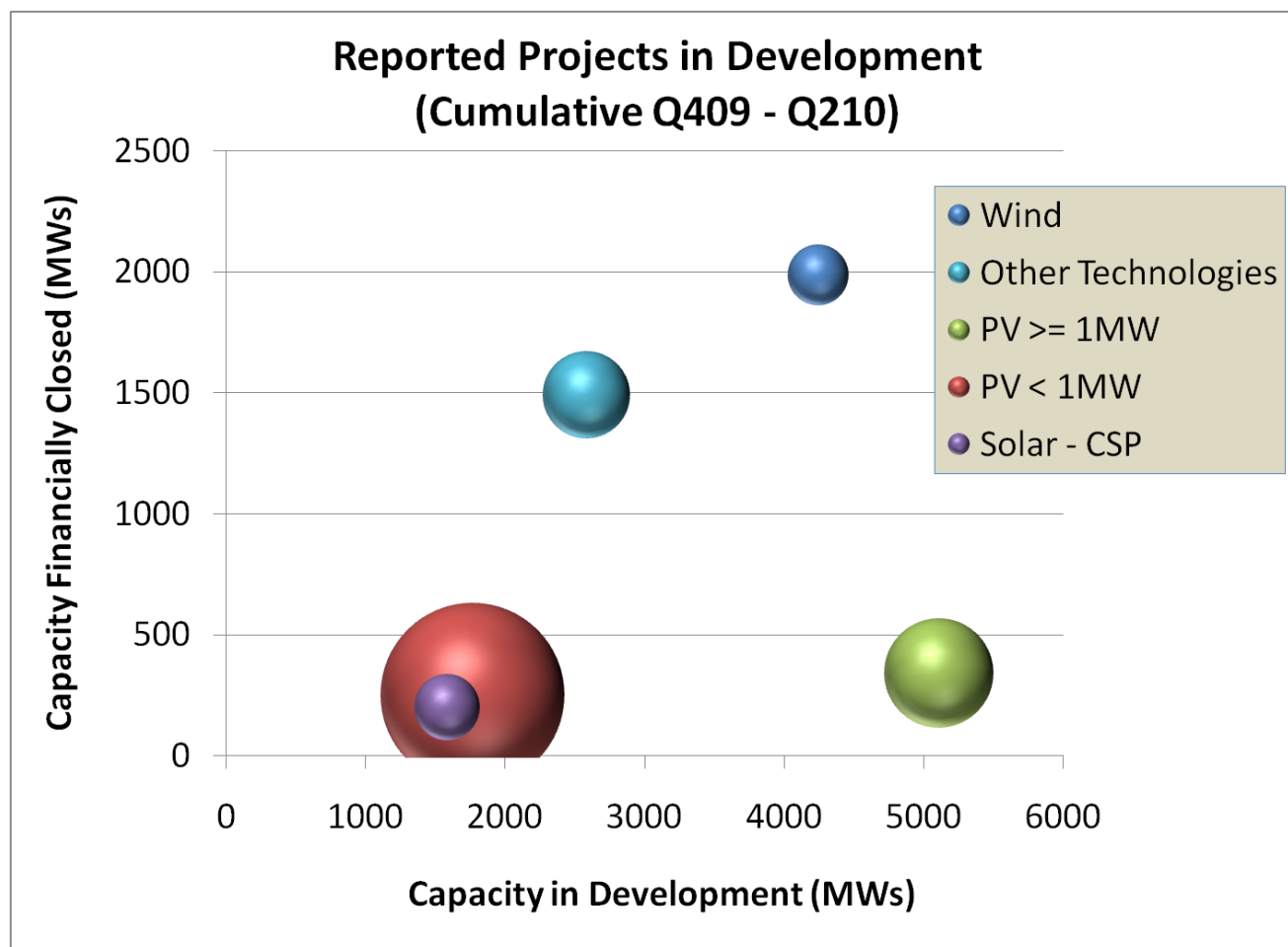


Number of RE Projects Reported



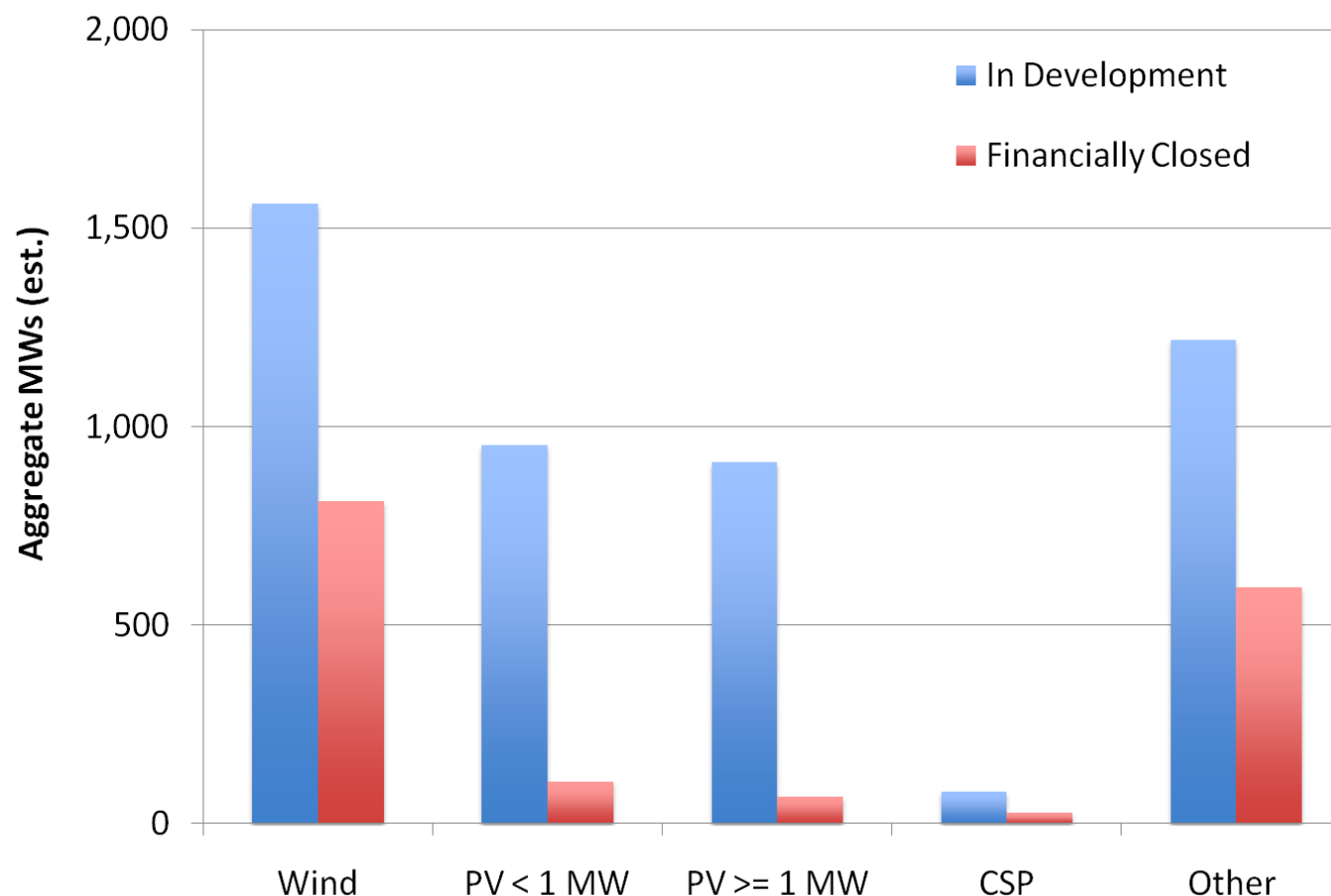
116 respondents reported approximately 1060 projects in development, with 420 projects having reached financial closure of some kind (up from 58 respondents and 912 in development)

Number of RE Projects Reported



Over past three quarters, REFTI participants have reported thousands of MW in development and financially closed for each technology. Bubble size = # of projects reported

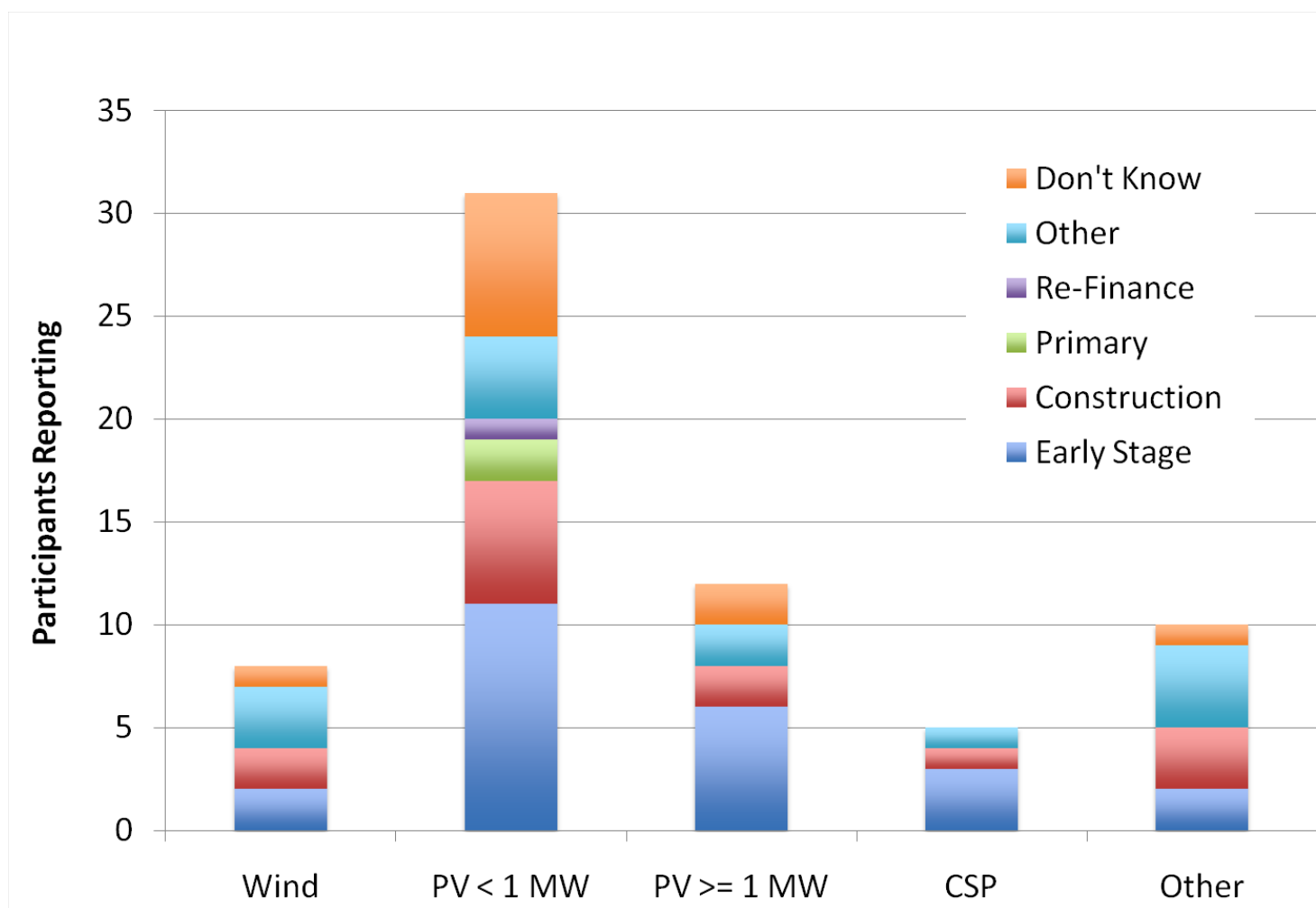
Capacity of Projects Reported (MWs)



Roughly 4,720 MW in development by REFTI participants with 1,600 MW reaching financial closure of some kind.

** Values estimated based on mid-point of questionnaire bins

Form of Financial Closure



66 respondents indicated form of financial closure. A high number of early stage and construction financings reported.

REFTI Questionnaire: Page 2, Q2 (Q4)

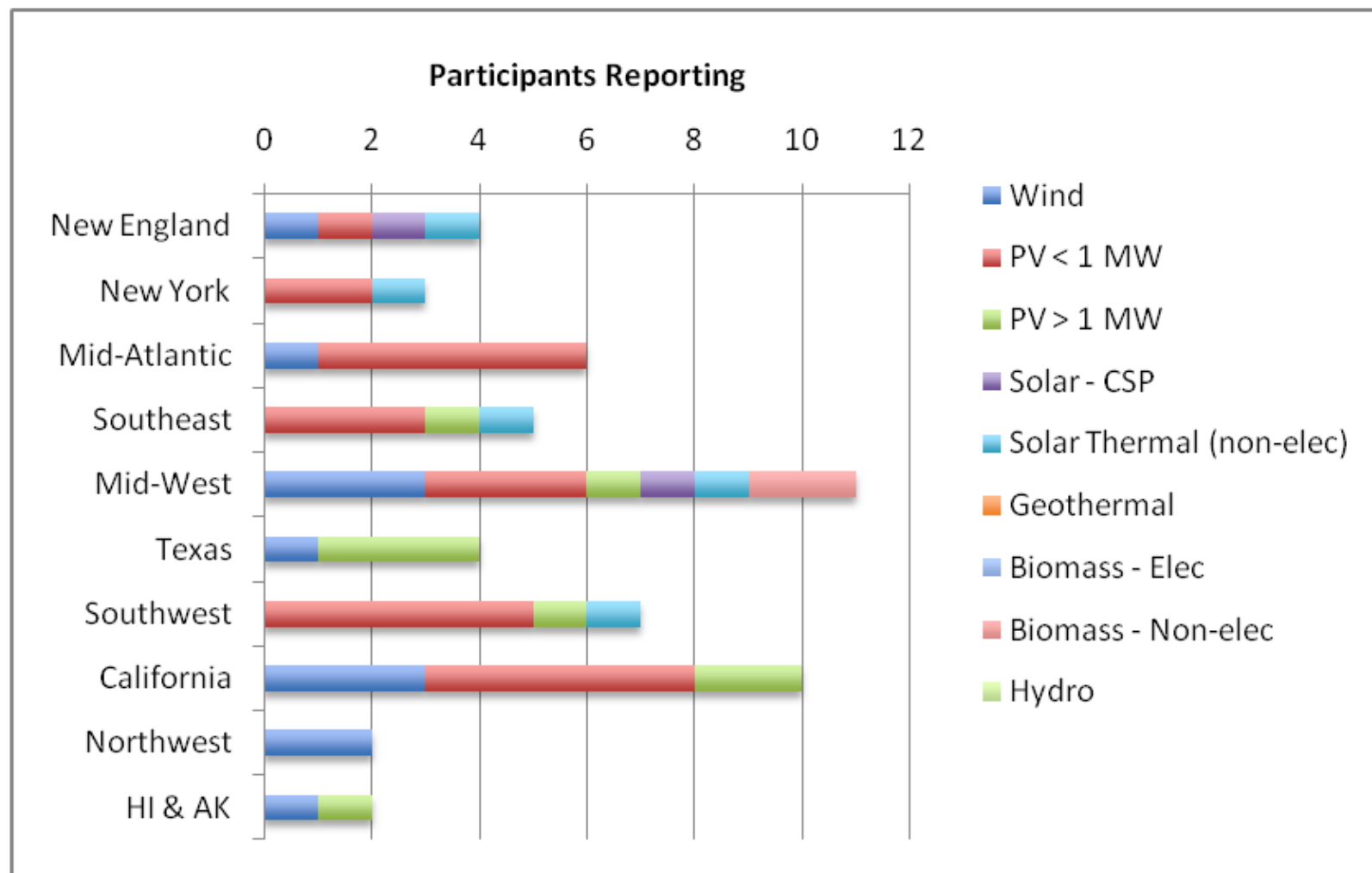
2. For projects that closed in Q2 2010, please tell us the **PRIMARY LOCATION**, **POWER PURCHASER**, and the **TOTAL** and **DIRECT INVESTMENT**...

| | Primary Region | Primary Power Purchaser (i.e., Power Sold To) | Total Cost of Combined Projects (\$ millions) | Your Total Direct Investment (\$ millions) |
|--------------------------|----------------------|---|---|--|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Comments

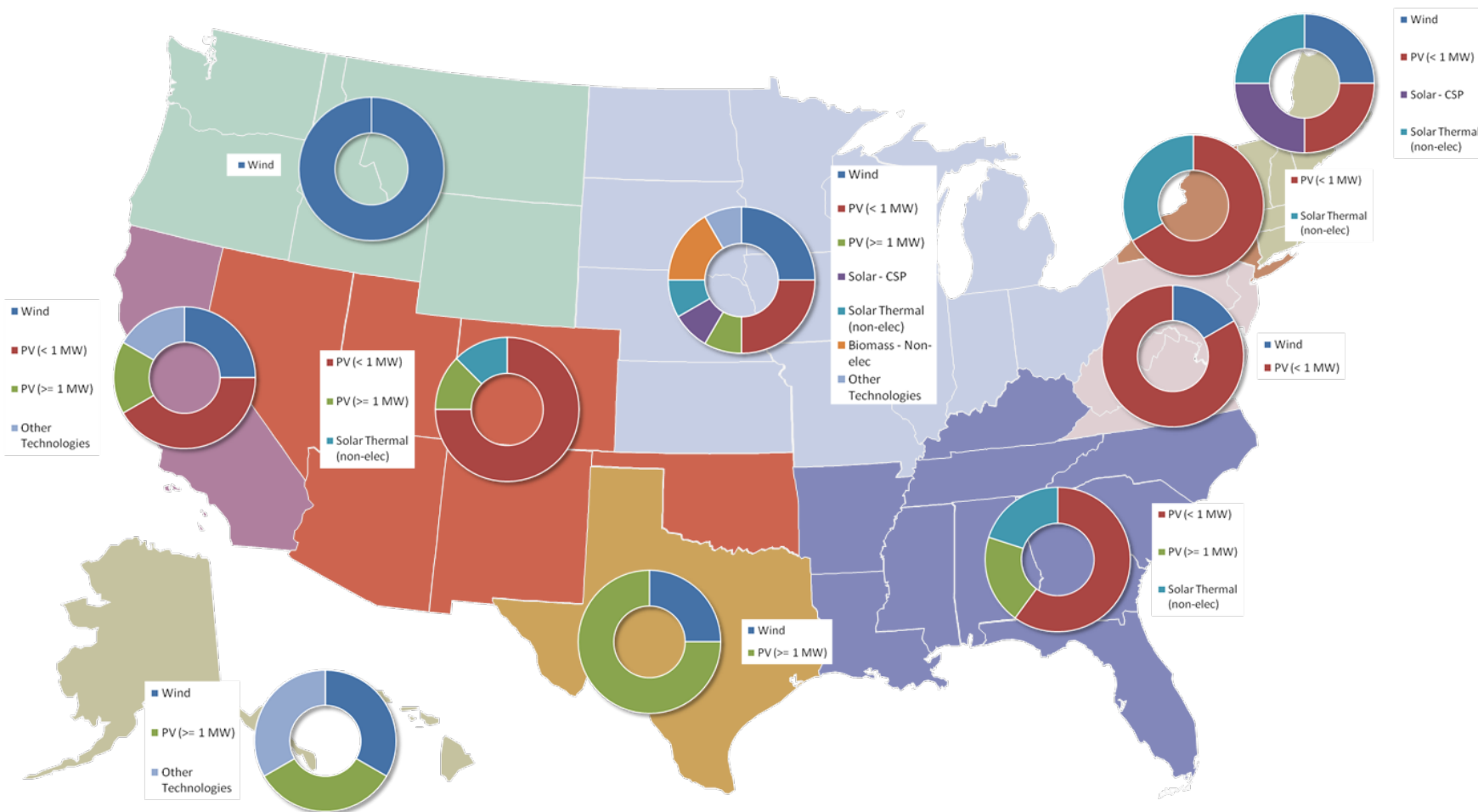


Financial Closures by Region

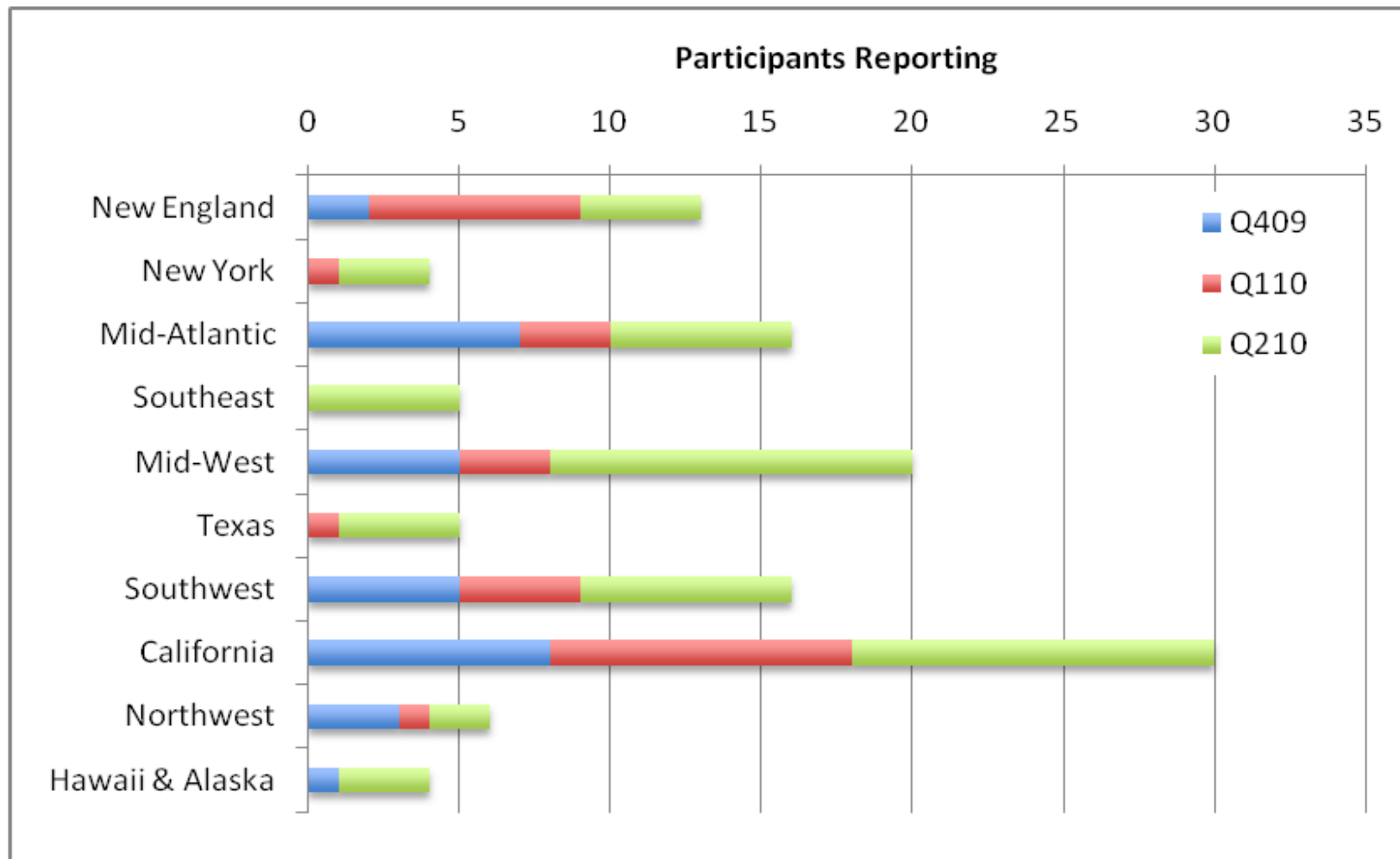


High number of REFTI participants reporting on projects in Mid-West and CA. All regions represented (59 total participants).

Financial Closures by Region

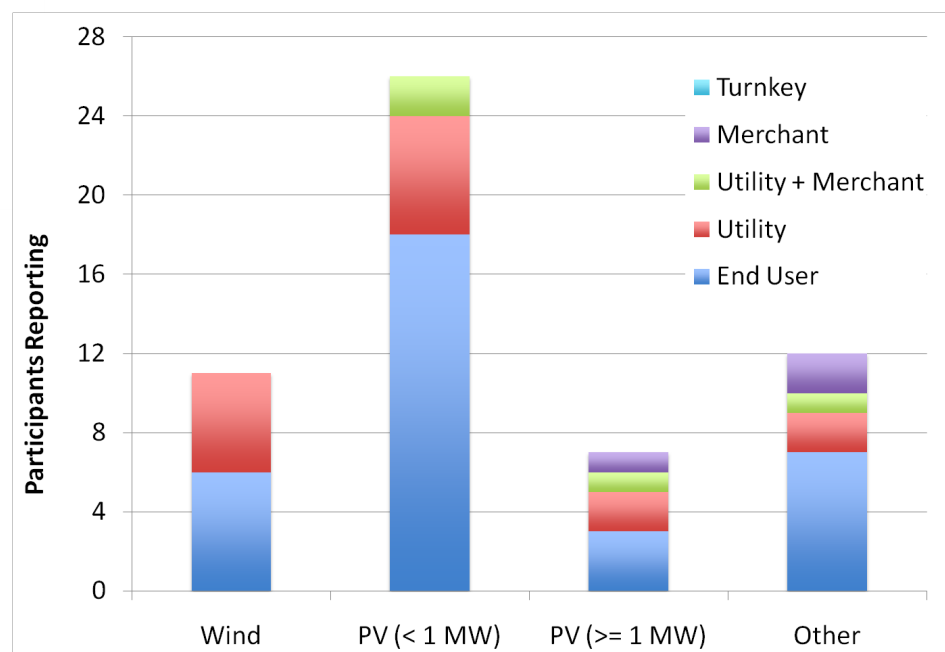
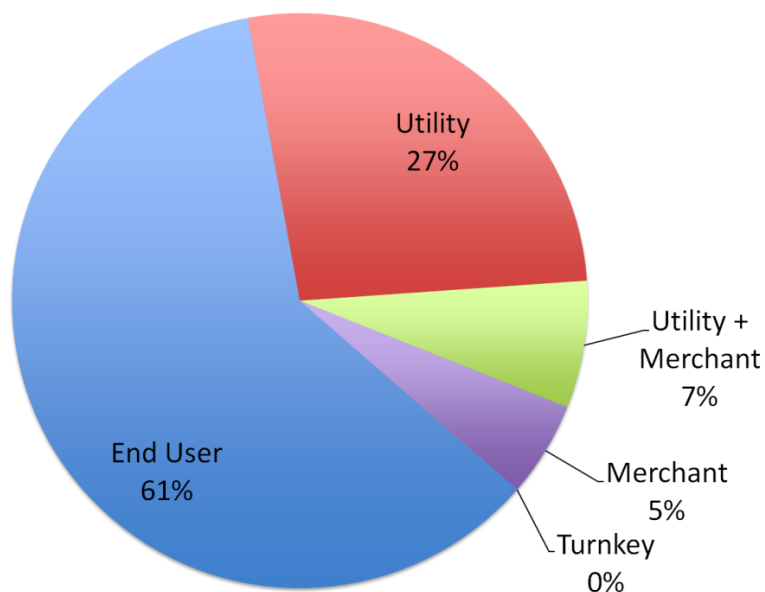


Financial Closures by Region – Trend



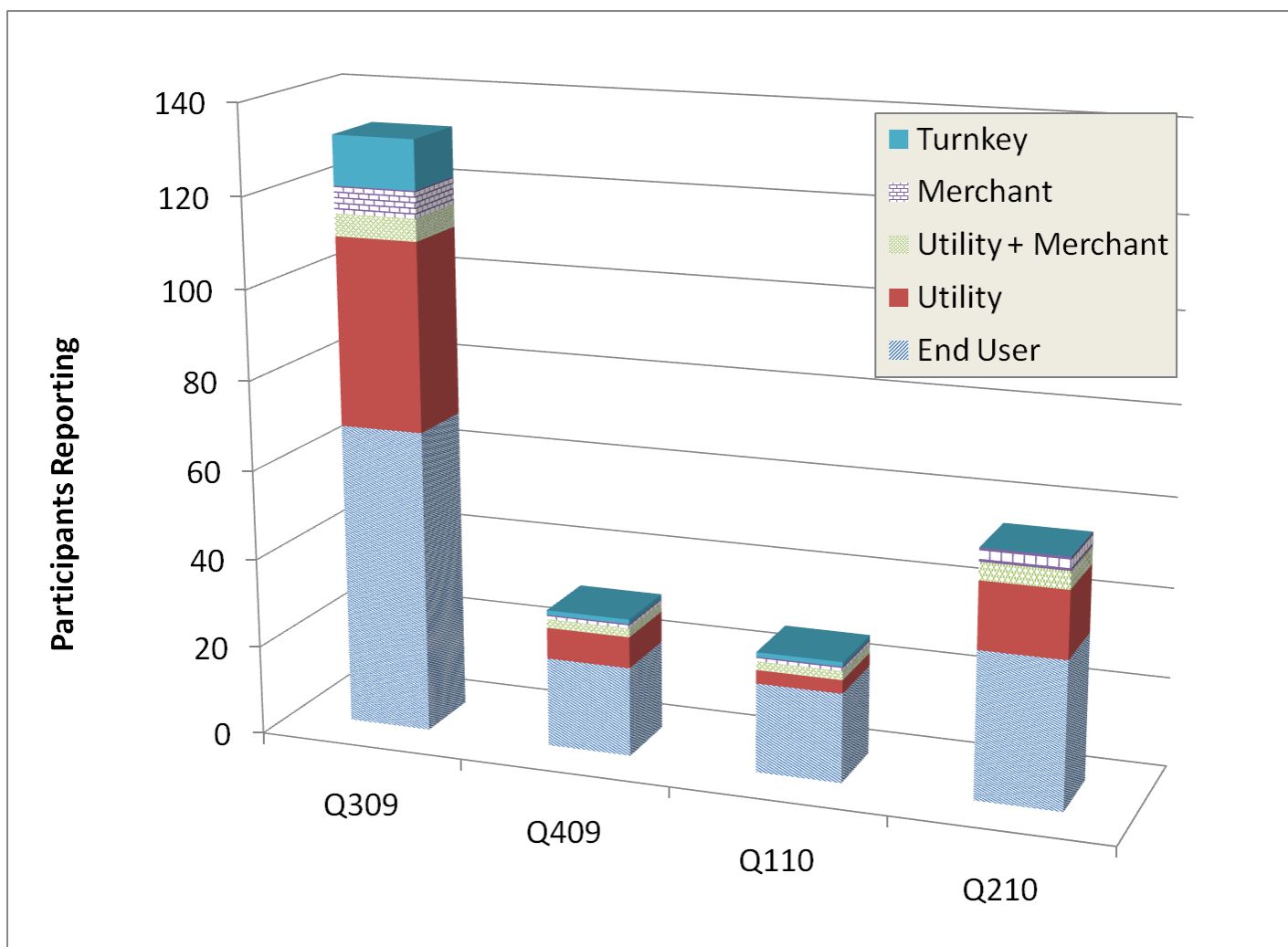
CA and mid-west & mid-Atlantic well represented

Primary Power Purchaser



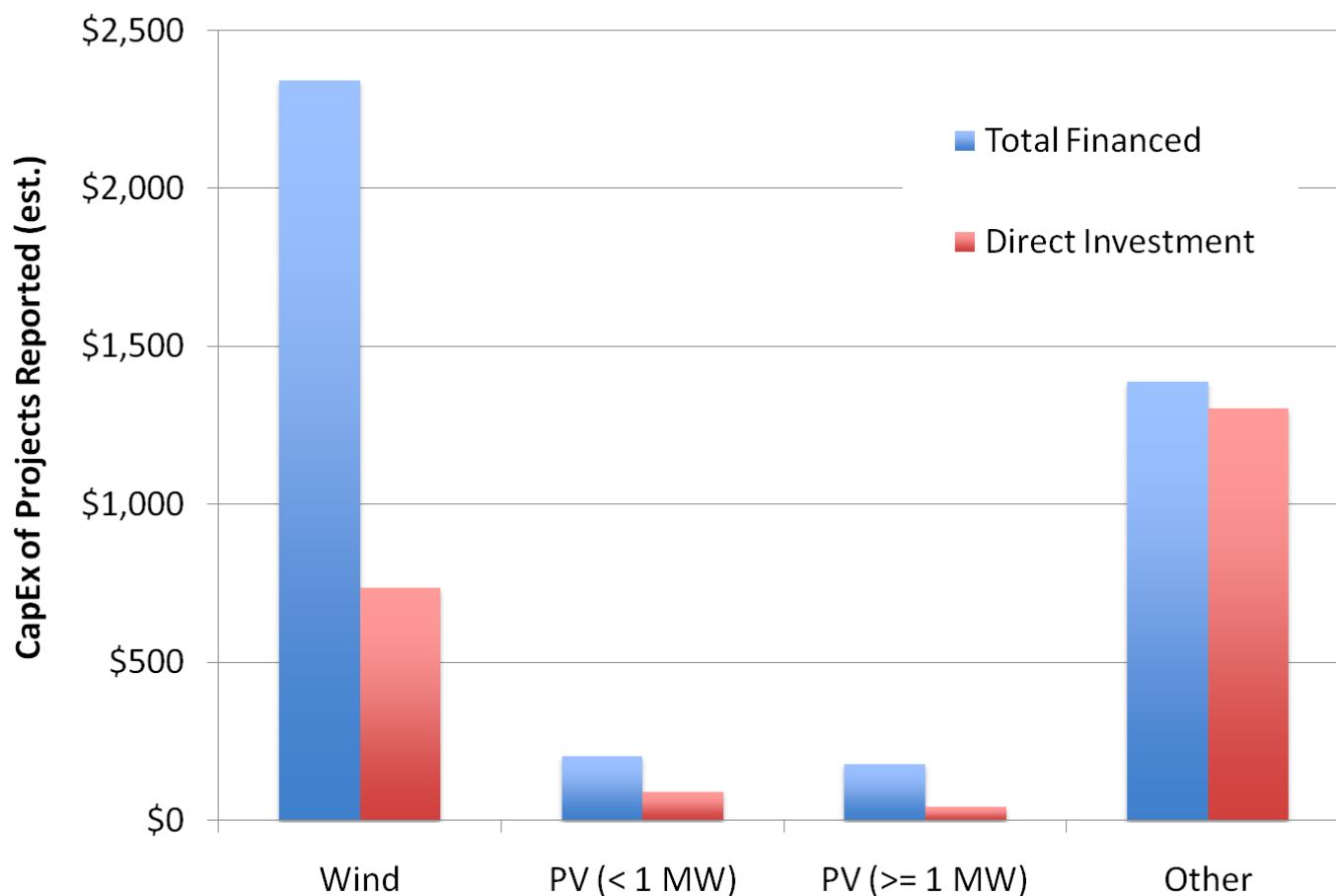
Most projects reported signed PPA with customer host. Some merchant sales (inc. remainder after utility sales) reported

Primary Power Purchaser - Trend



Most projects reported signed PPA with customer host. Some merchant sales (inc. remainder after utility sales) reported

Capital Expenditure Reported (\$MM)



REFTI participants reported \$4.1B in projects in development, \$1.25B of direct finance coming from REFTI participants.

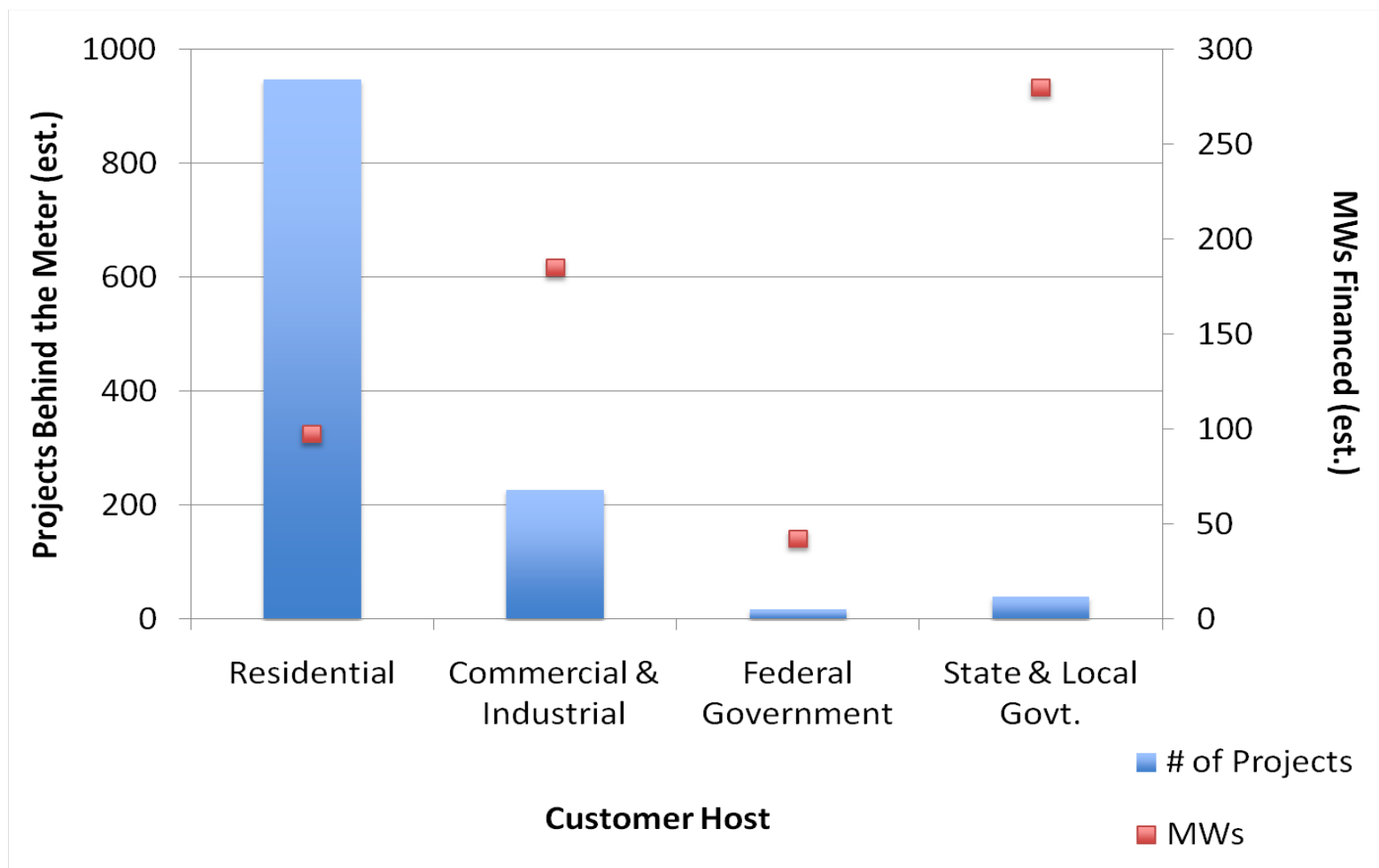
** Values estimated based on mid-point of questionnaire bins

REFTI Questionnaire: Page 2, Q3 (Q5)

3. For your projects that are **ON-SITE** and **BEHIND-THE-METER**, please tell us about the customer host...

| | Number of Deals | Nameplate Capacity (aggregate MW) | Typical Customer Financing Structure | Avg. Customer Payback (yrs) | Avg. Customer Discount Rate (%) |
|-------------------------|-----------------------------------|--------------------------------------|--------------------------------------|-----------------------------|---------------------------------|
| Residential | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Commercial & Industrial | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Federal Government | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| State & Local Govt. | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Comments | <div><div></div><div></div></div> | | | | |

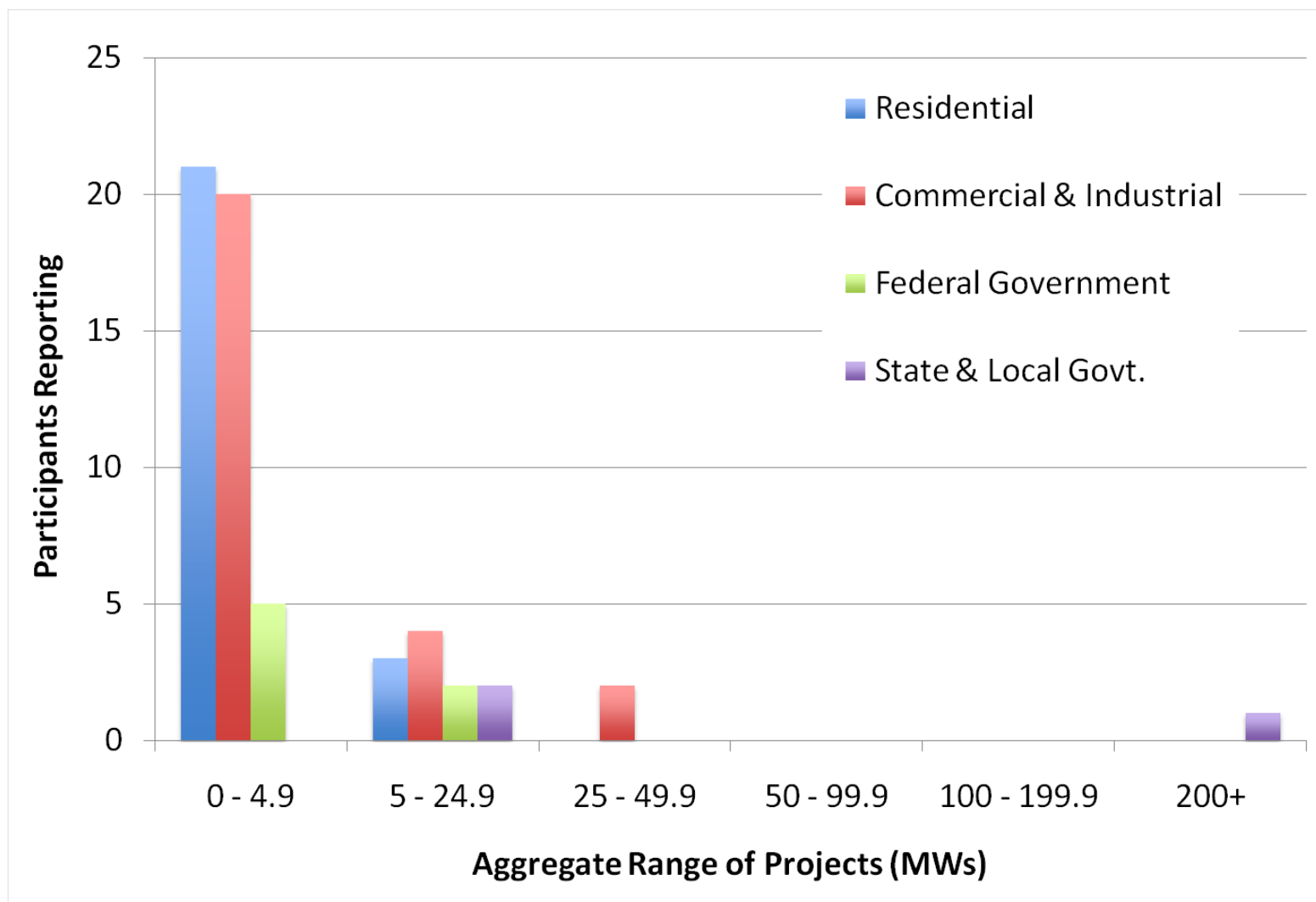
No. & MWs of Projects with Customer Host



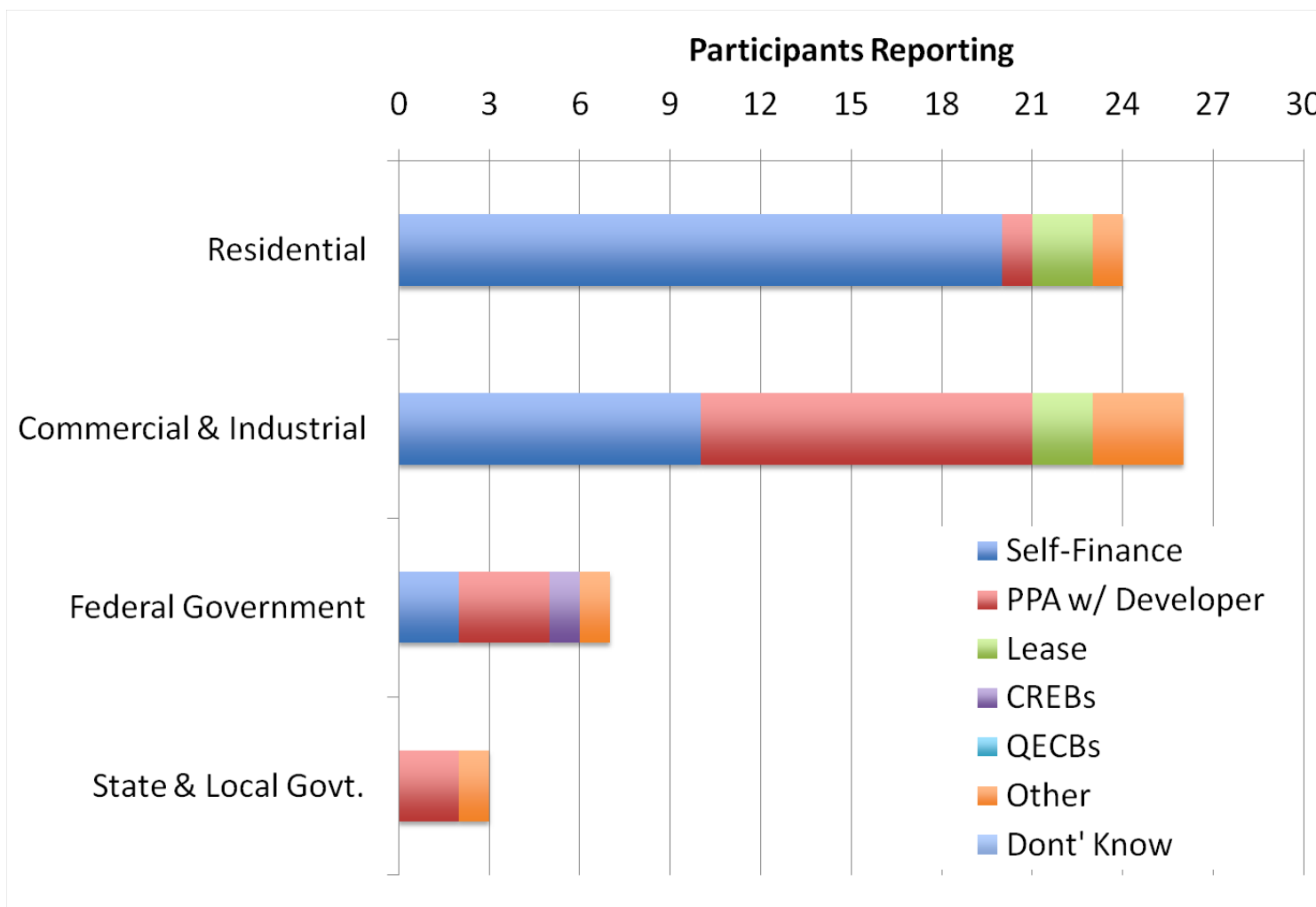
Roughly 1200 projects, representing 605 MW, reported with customer host. Very high MW project reported for state & local govt.

** Values estimated based on mid-point of questionnaire

No. & MWs of Projects with Customer Host

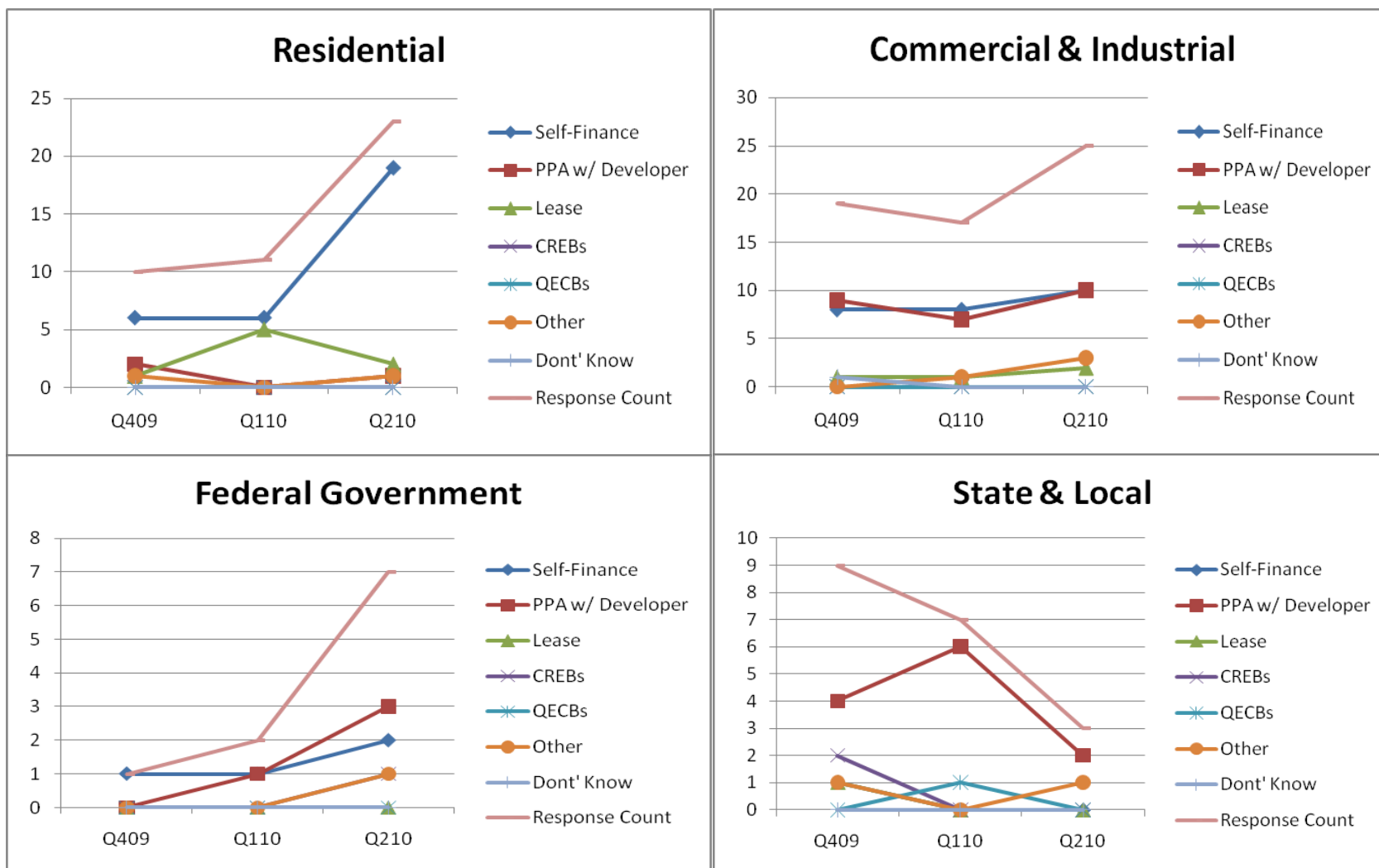


Form of Customer Host Financing



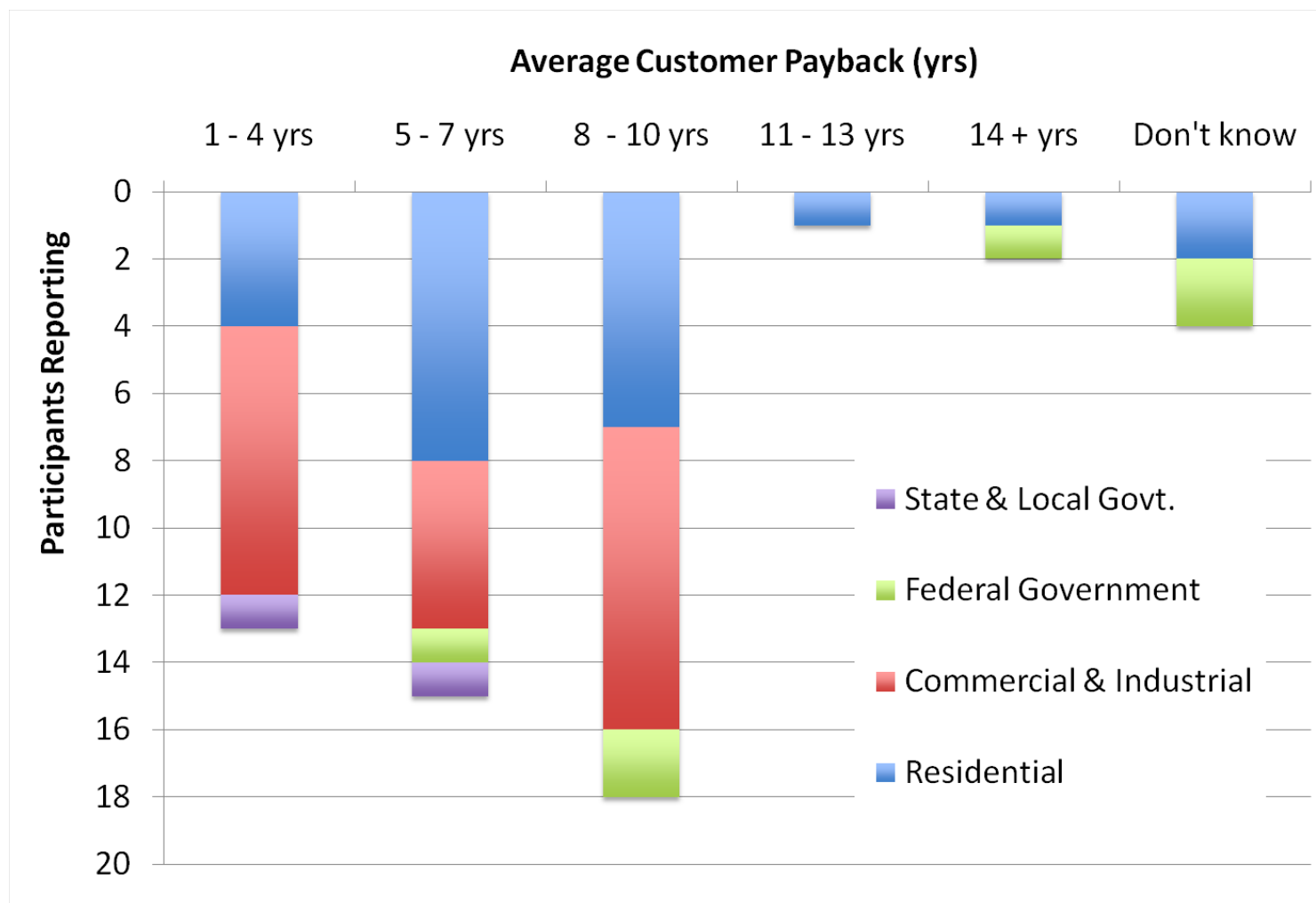
Most residential deals are self-financed. Most C&I deals are financed via PPA with developers

Customer Host Financing – Trend Analysis



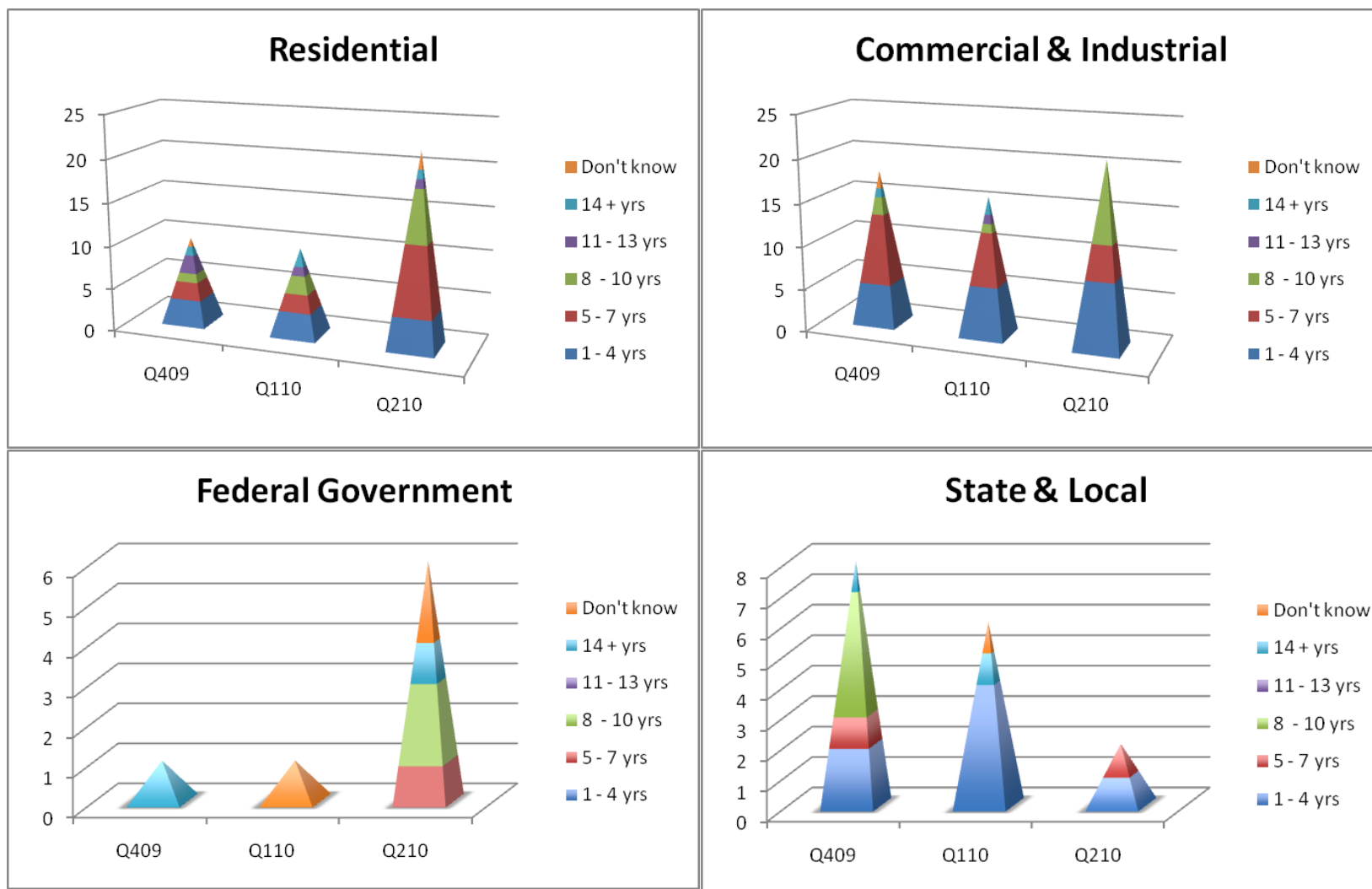
Trends by customer sector

Customer Host Payback (Yrs)



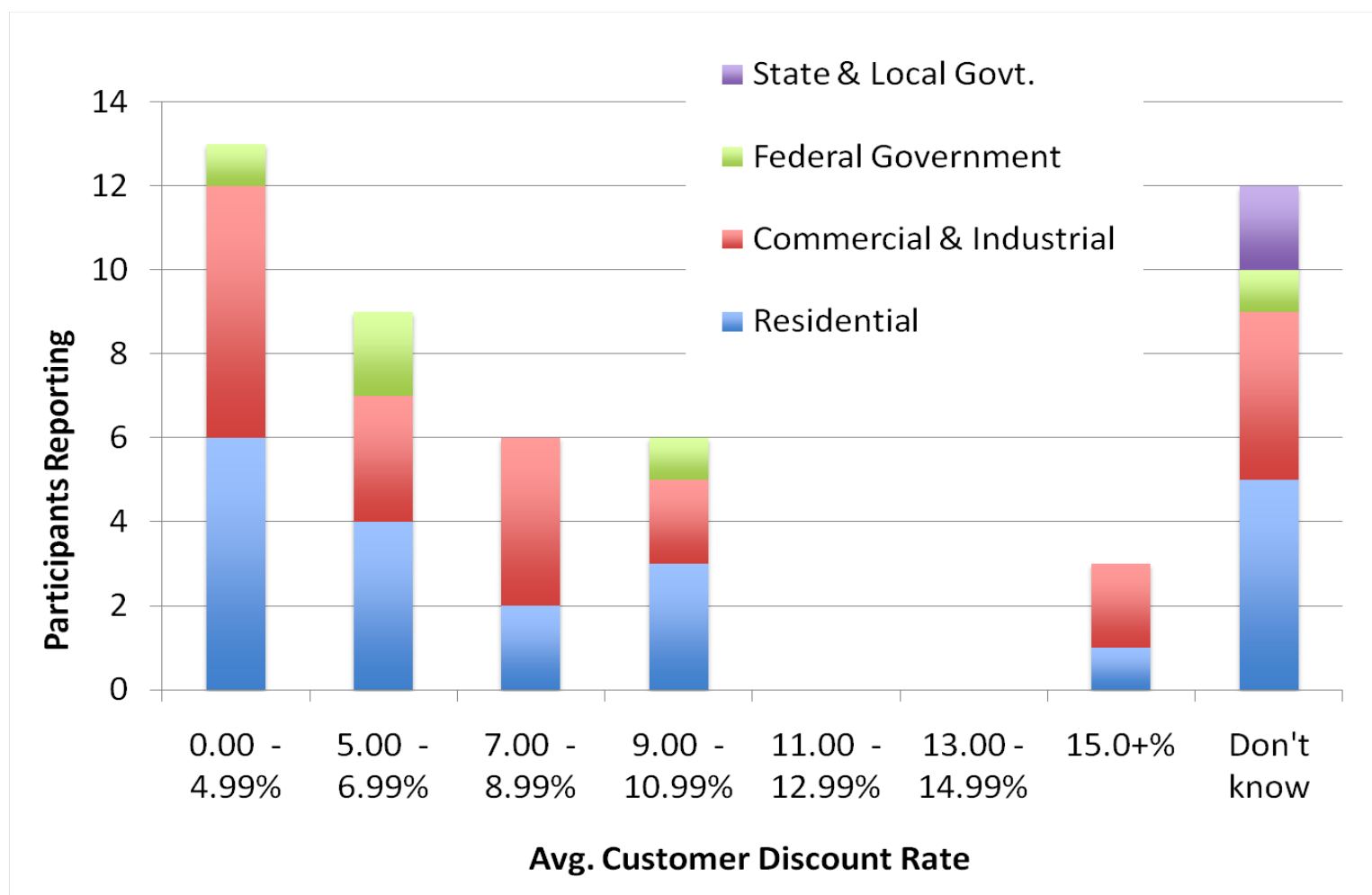
Most projects have 10 year or lower payback. Very wide range on residential deals (likely tied to utility power price and REC purchase)

Customer Host Payback – Trend Analysis



Q2 10 first opportunity to look at federal govt. projects - most have payback of 10 years or less.

Customer Host Discount Rate



Customer discount rates are estimated to be fairly low (most under 9%). Fairly high “don’t knows” as expected

REFTI Questionnaire: Page 2, Q4 (Q6)

4. What was the **LARGEST BARRIER** to **RE** project development and how did it impact your projects

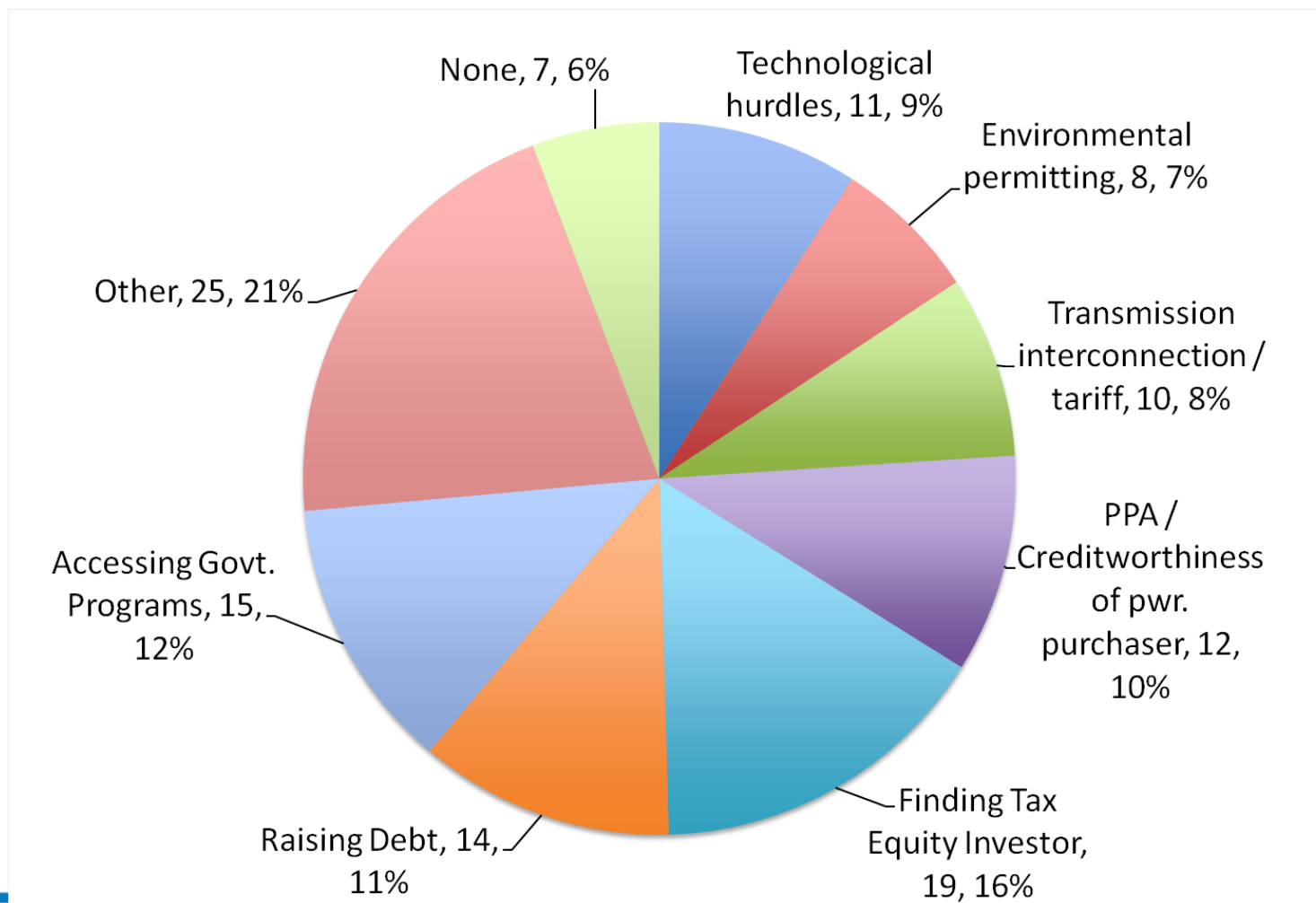
| | Barrier | Impact |
|--------------------------|----------------------|----------------------|
| Wind | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> |

Comments



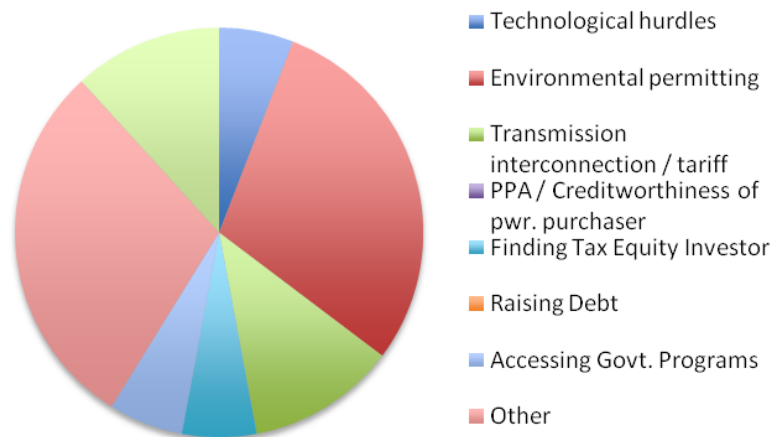
Largest Barriers to RE Development

About 50% of respondents referenced financing-related barrier as most significant; Other still a significant category

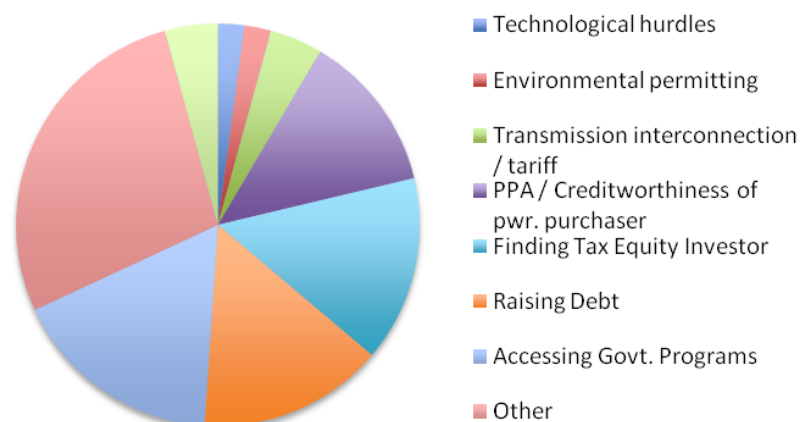


Largest Barrier – Tech Breakout

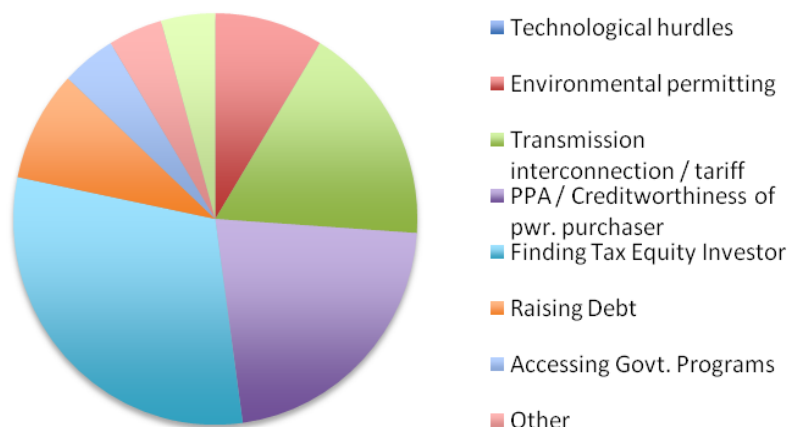
Wind



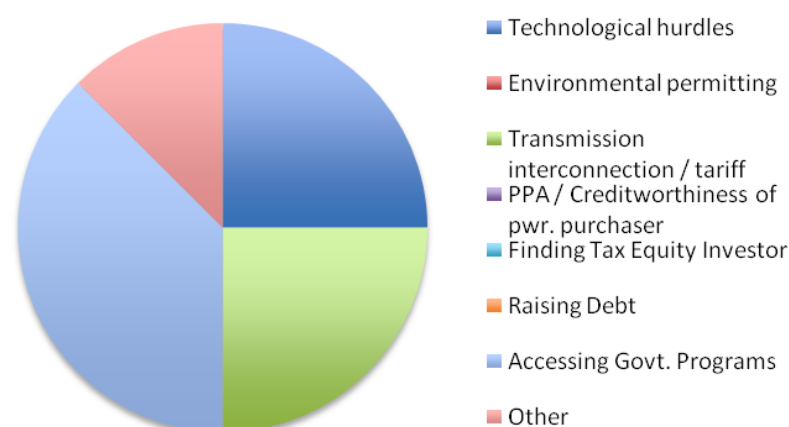
PV (< 1 MW)



PV (>= 1 MW)

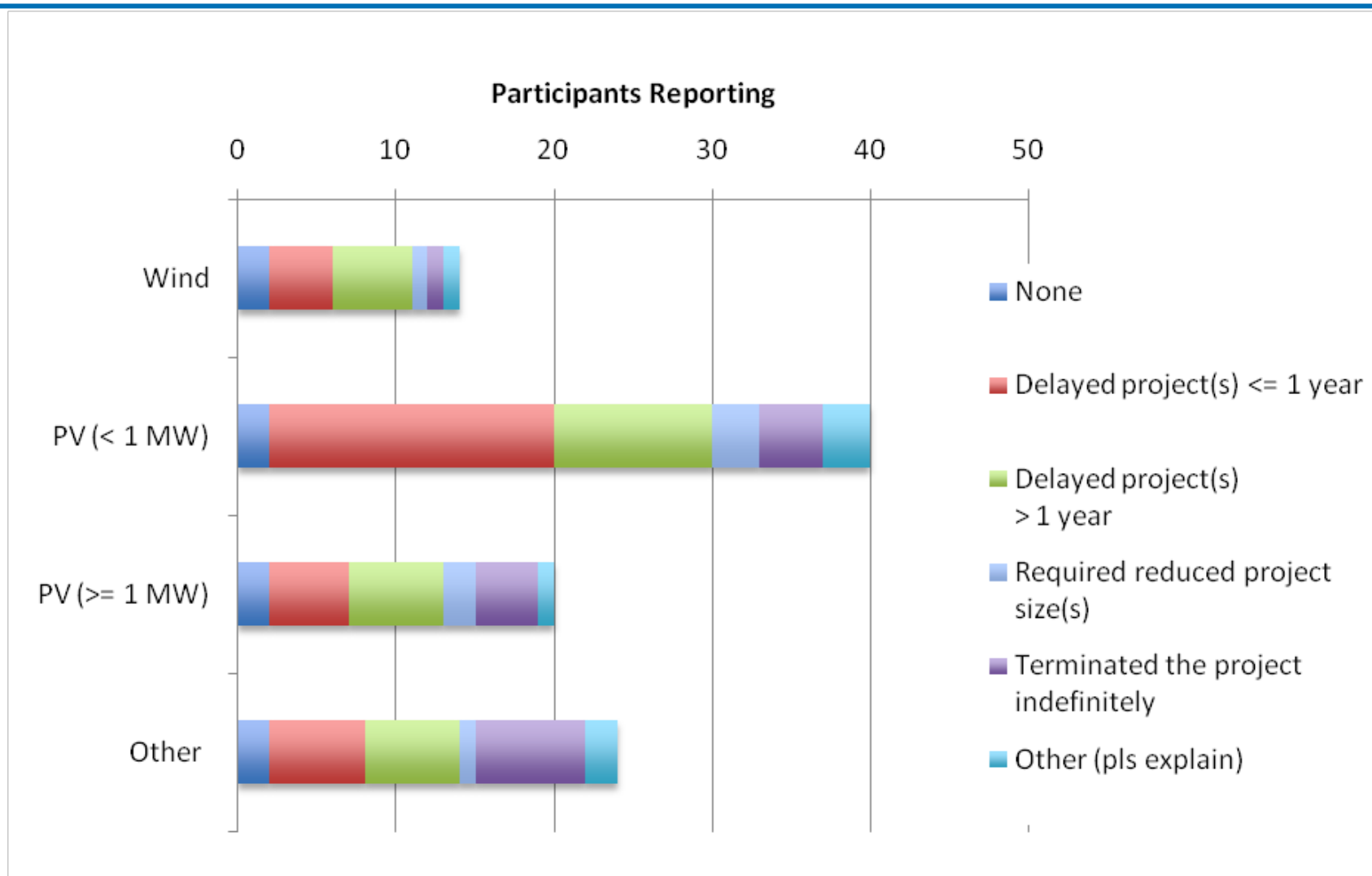


Solar - CSP



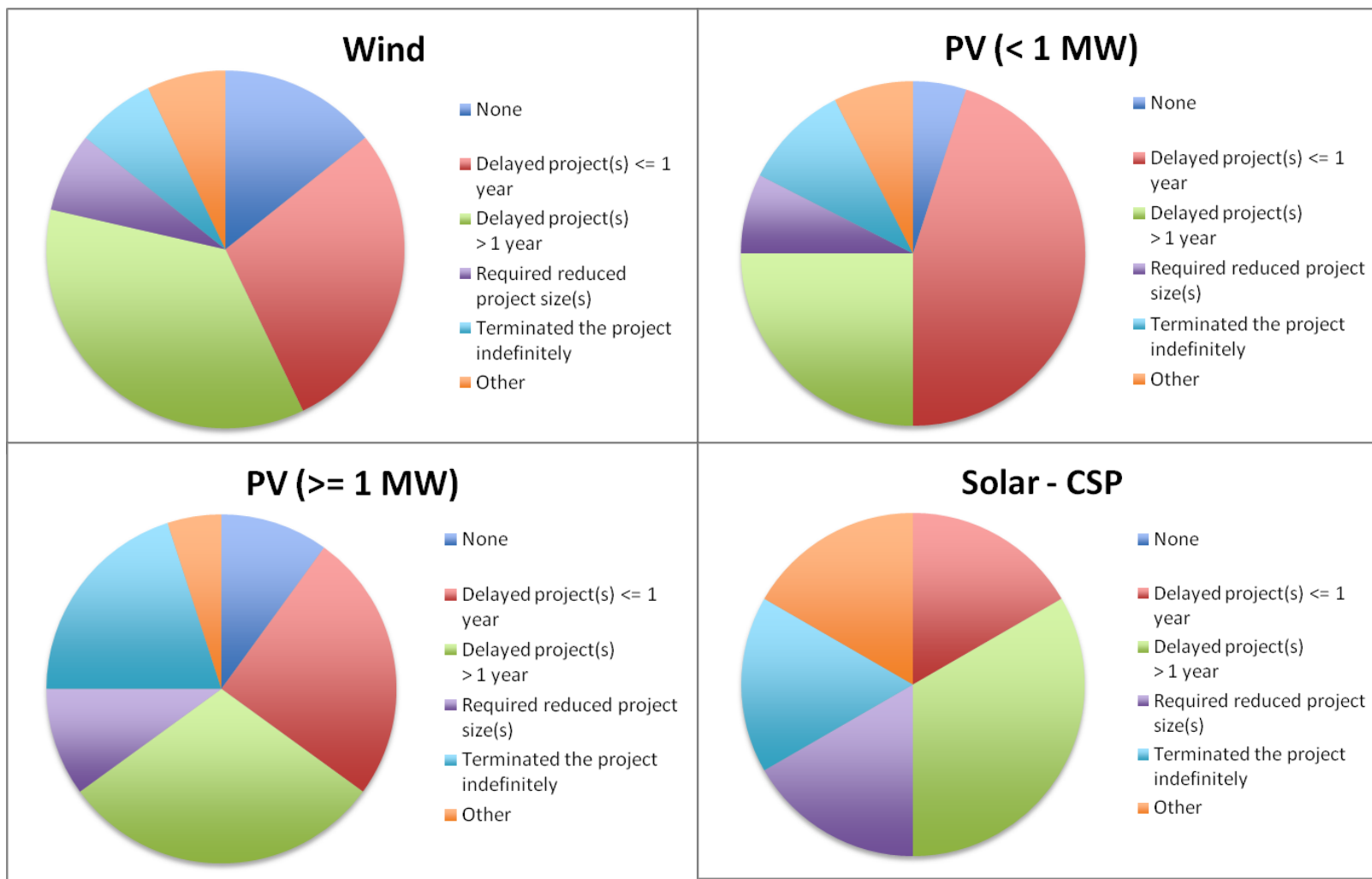
Tech hurdles not mentioned for large PV, solar CSP dominated by Accessing Govt. Programs

Consequence of Development Barrier(s)



Very few projects indicate no consequence to development barriers.
Short-term delays (<1 year) most common consequence.

Consequence of Barriers – Tech Breakout



Large PV and CSP projects have longer delays / project terminations; small PV projects have less project resizing, termination.

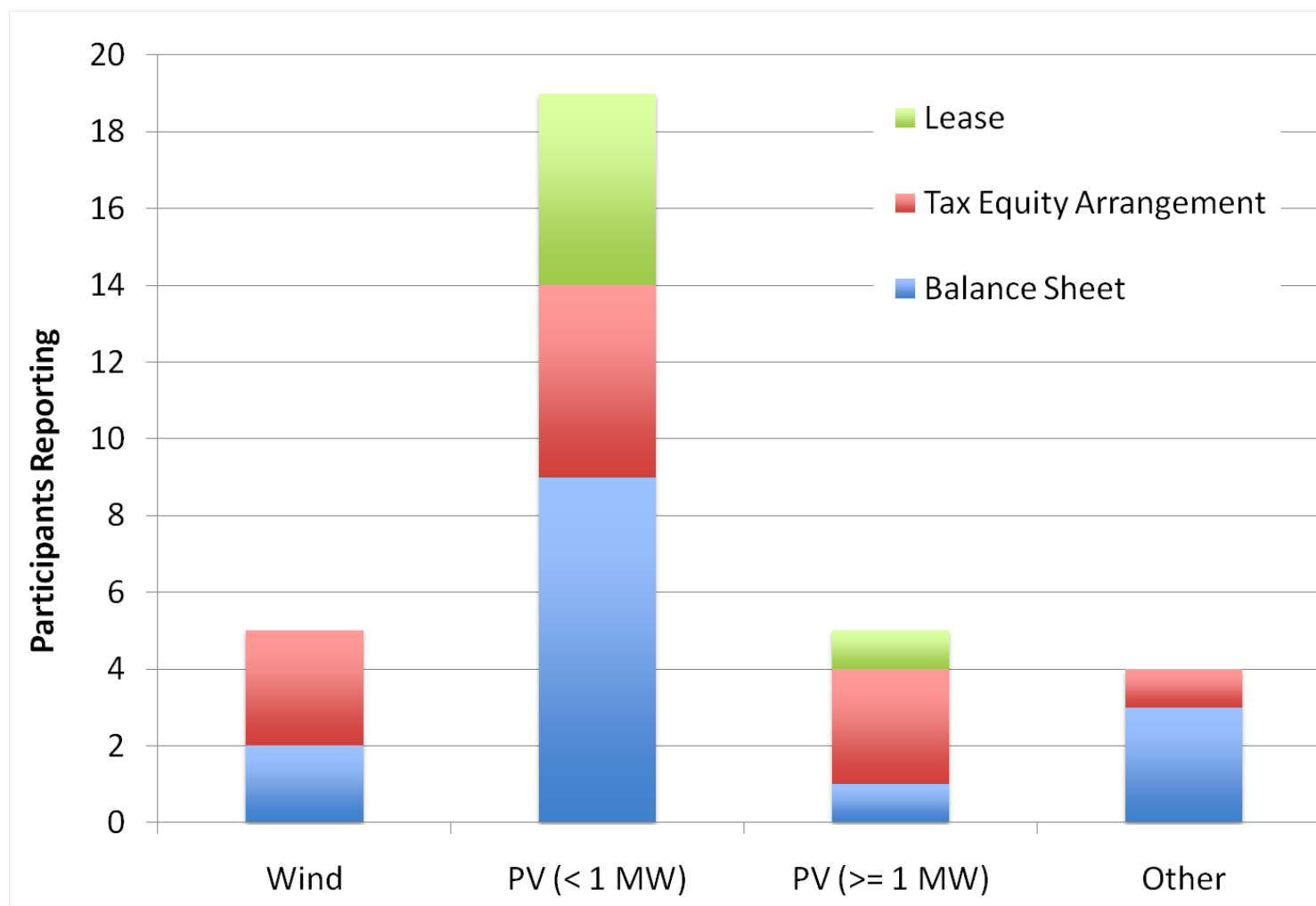
REFTI Questionnaire, Page 3, Q1 (Q7)

1. Select the primary typical **FINANCIAL STRUCTURE** characteristics of your projects that closed in prior quarter...

| | Financial Structure | Depreciation | Federal Incentive | State Incentive |
|--------------------------|----------------------|----------------------|----------------------|----------------------|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Comments

Financial Structure of Projects Reported

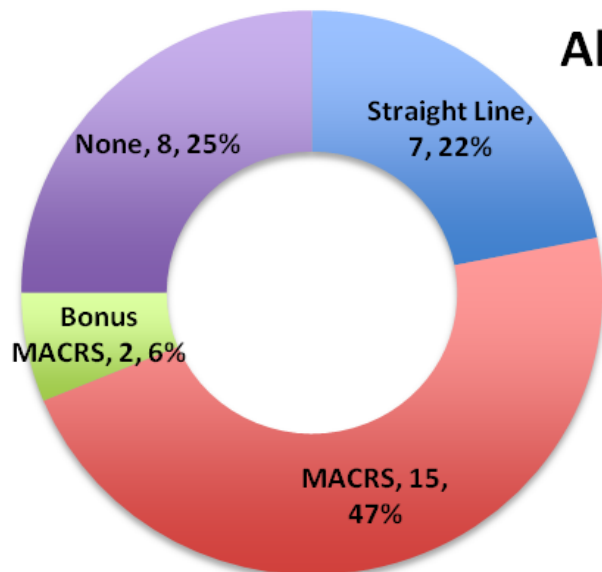


Balance sheet finance still critical for smaller projects. Tax equity and lease arrangements more relevant for wind and larger PV

Form of Depreciation Taken

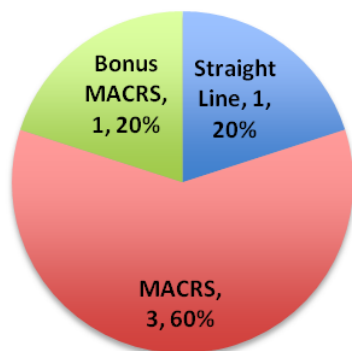


All Technologies

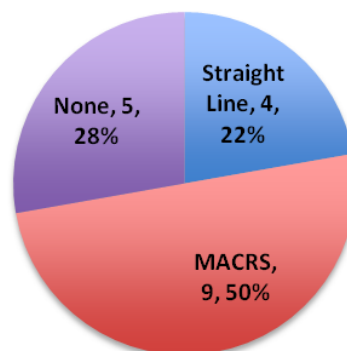


MACRS depreciation applied in roughly half of projects reported (32 participants responding)

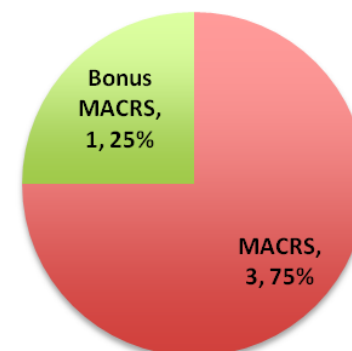
Wind



PV < 1 MW

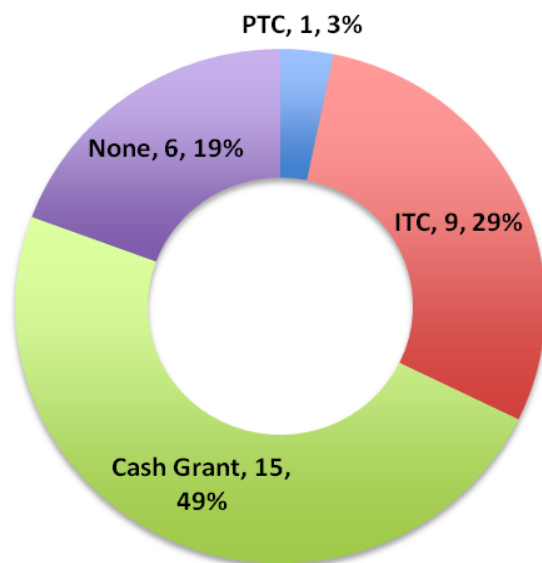


PV >= 1 MW



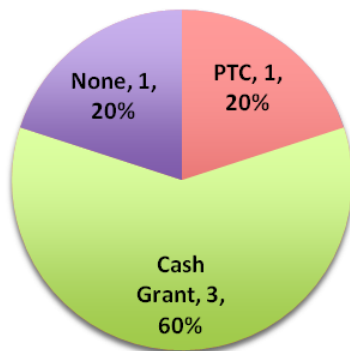
Form of Federal Incentive Taken

All Technologies

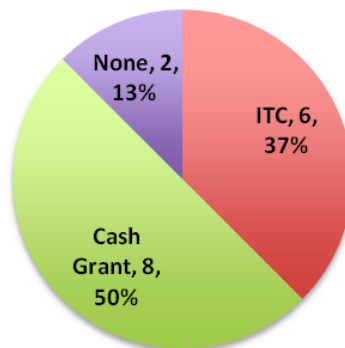


31 participants reporting,
almost half taking the cash
grant

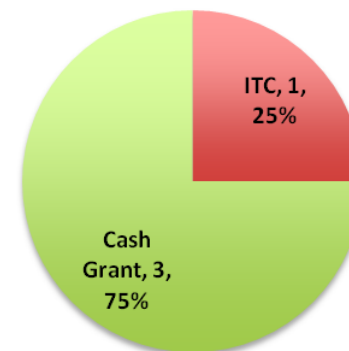
Wind



PV < 1 MW



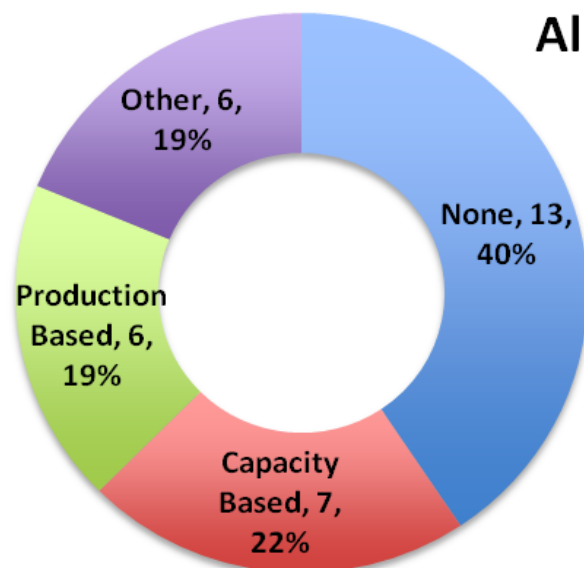
PV ≥ 1 MW



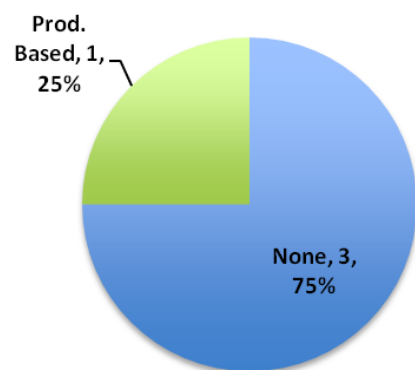
Form of State Incentive Taken



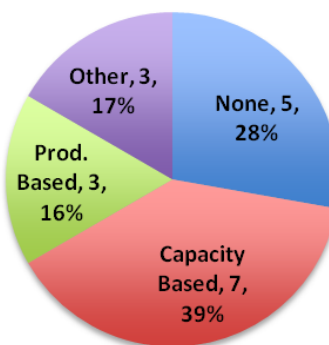
All Technologies



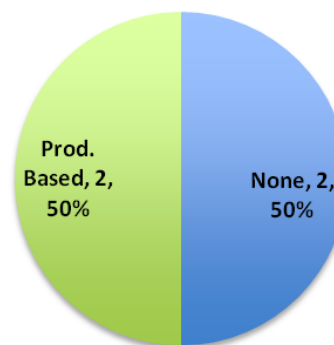
Wind



PV (< 1 MW)



PV (>= 1 MW)



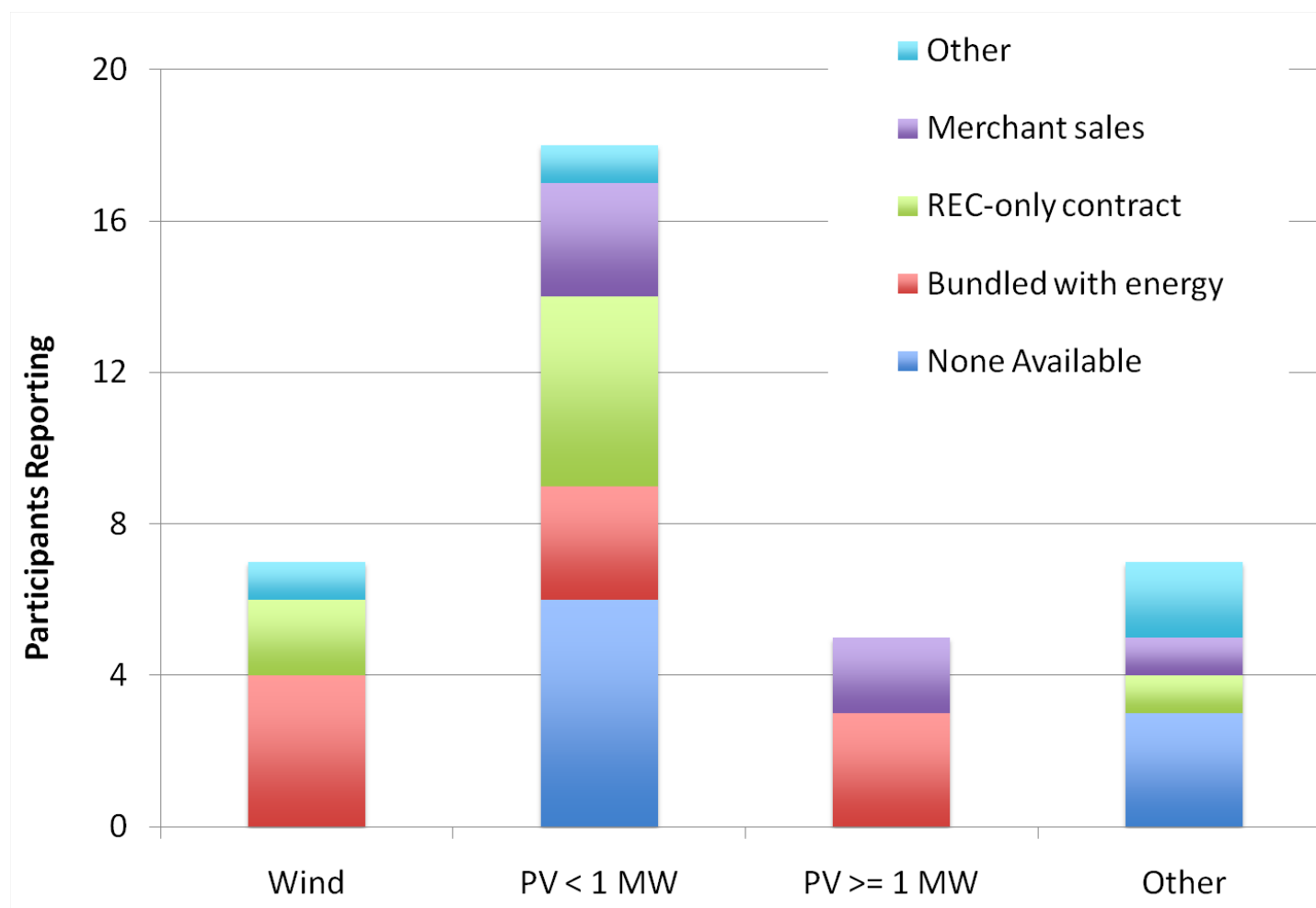
REFTI Questionnaire: Page 3, Q2 (Q8)

2. Provide the typical expected method of REC Sales, REC Type, and REC Contract Duration by technology...

| | REC Sales | REC Type | REC Contract Term (yrs) |
|--------------------------|----------------------|----------------------|-------------------------|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> |

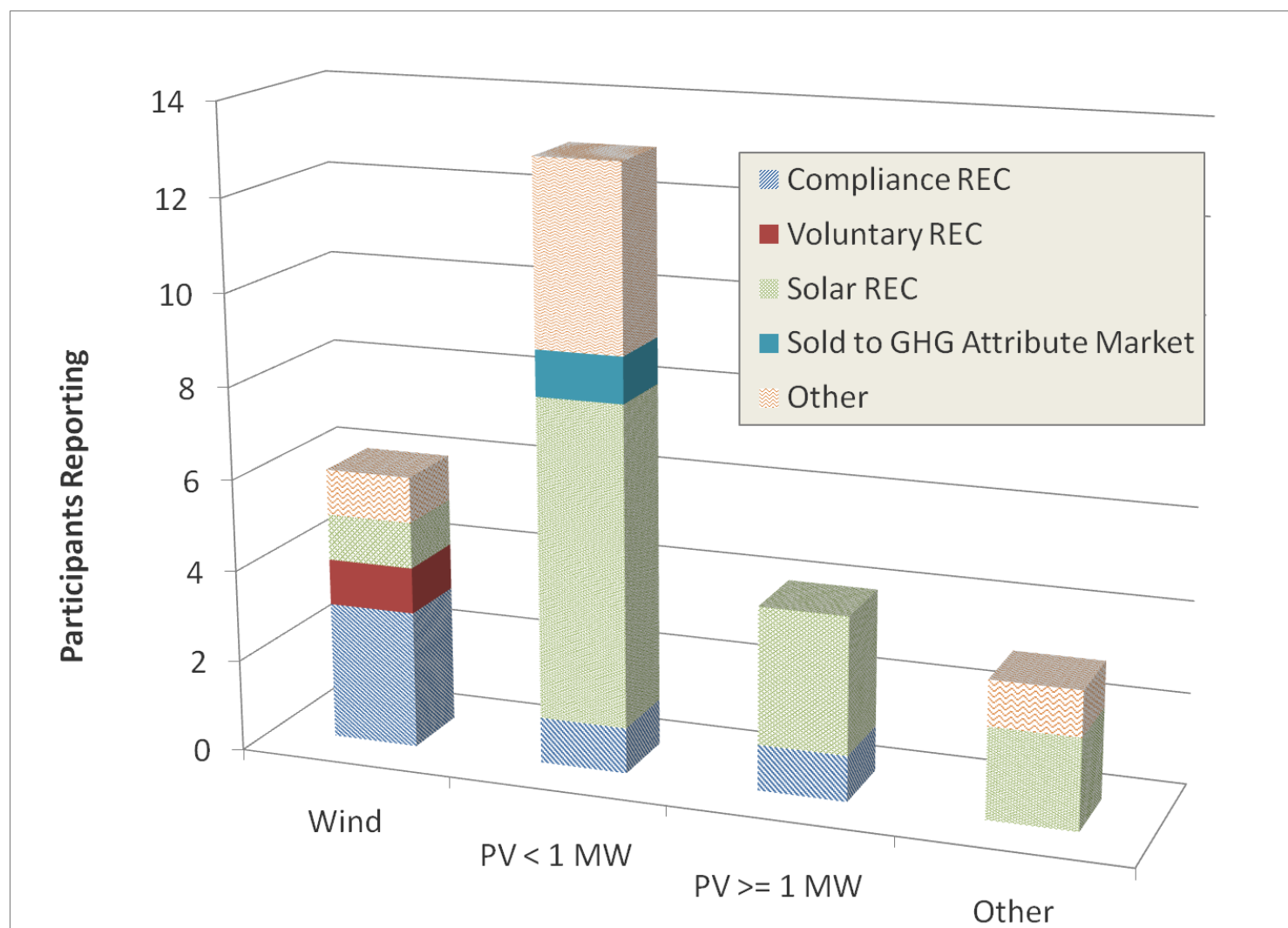
Comments

Form of REC Sales



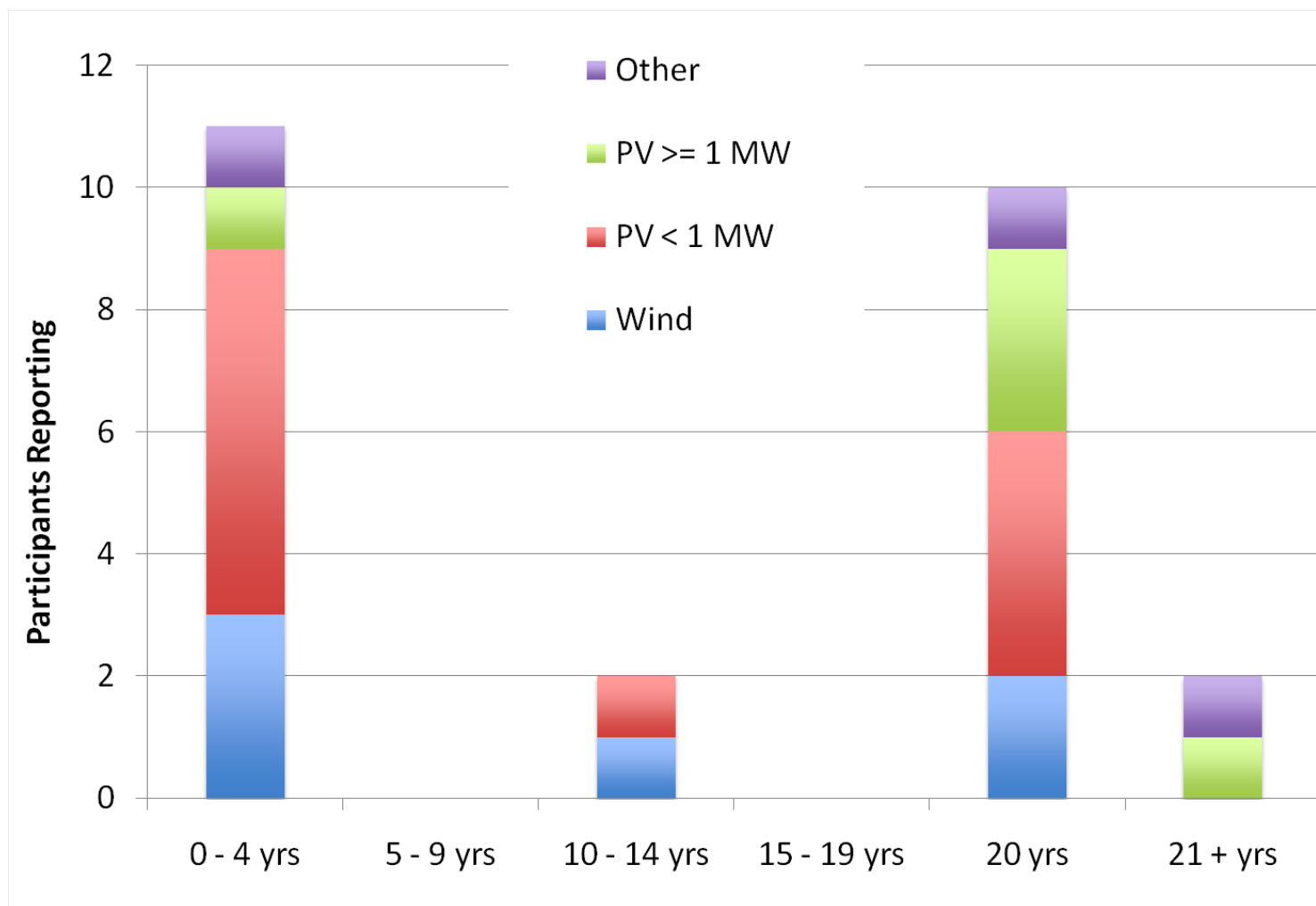
RECs most commonly bundled with energy (10/37) but REC-only contract (8/37) and none available (9/37) were also common among REFTI participants

Type of RECs Sold



One half of the participants reported use of Solar RECs. Voluntary REC markets largely irrelevant

REC Contract Duration



REC contracts generally fall into very short-term (< 4 years) or 20 year long-term durations

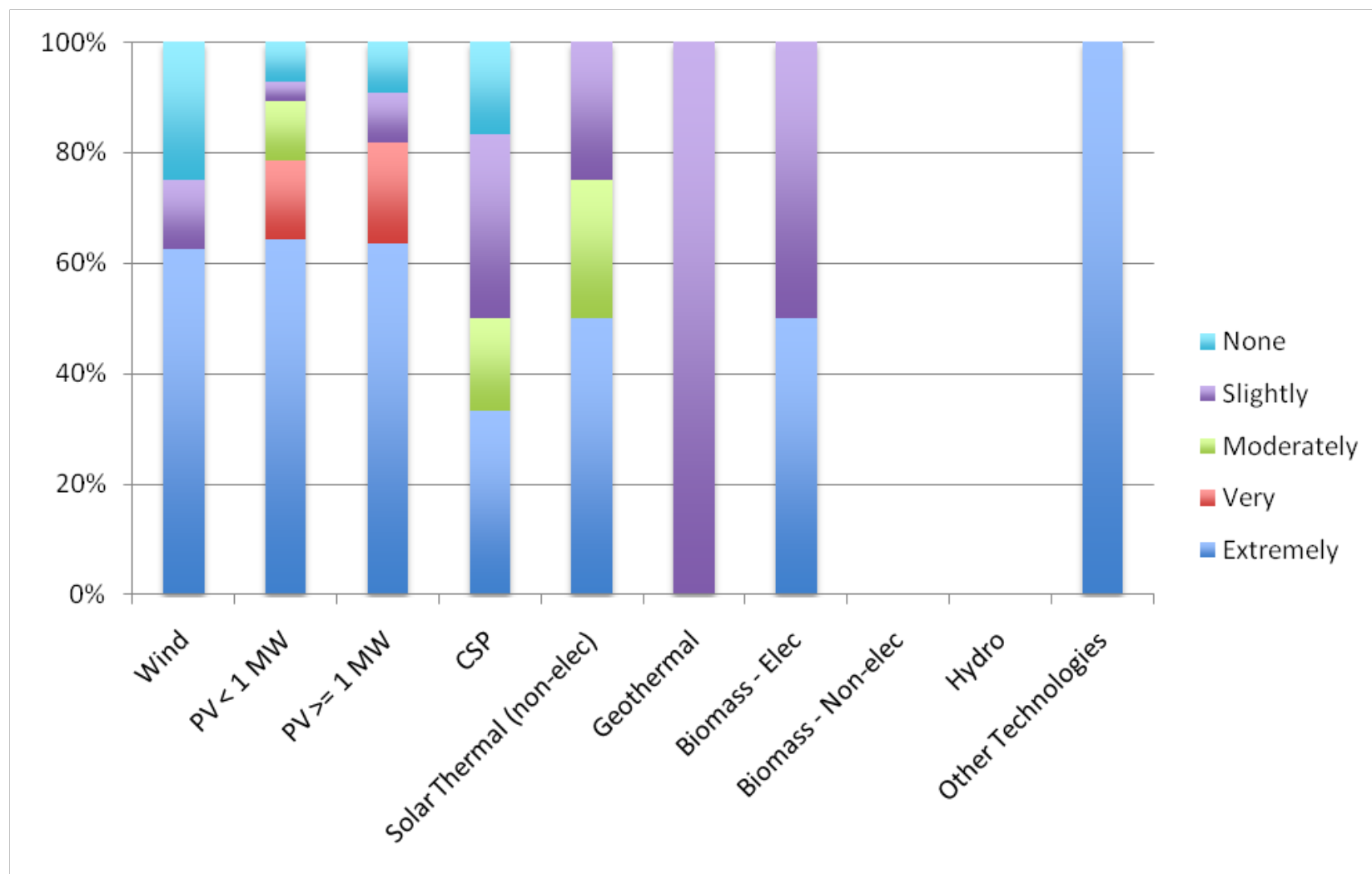
REFTI Questionnaire: Page 3, Q3 (Q9)

3. Please comment on the IMPORTANCE of different INCENTIVE PROGRAMS to developing your projects...

| | Treasury Grants | State Incentives | Renewable Portfolio Standards (REC purchase) |
|--------------------------|----------------------|----------------------|---|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> |

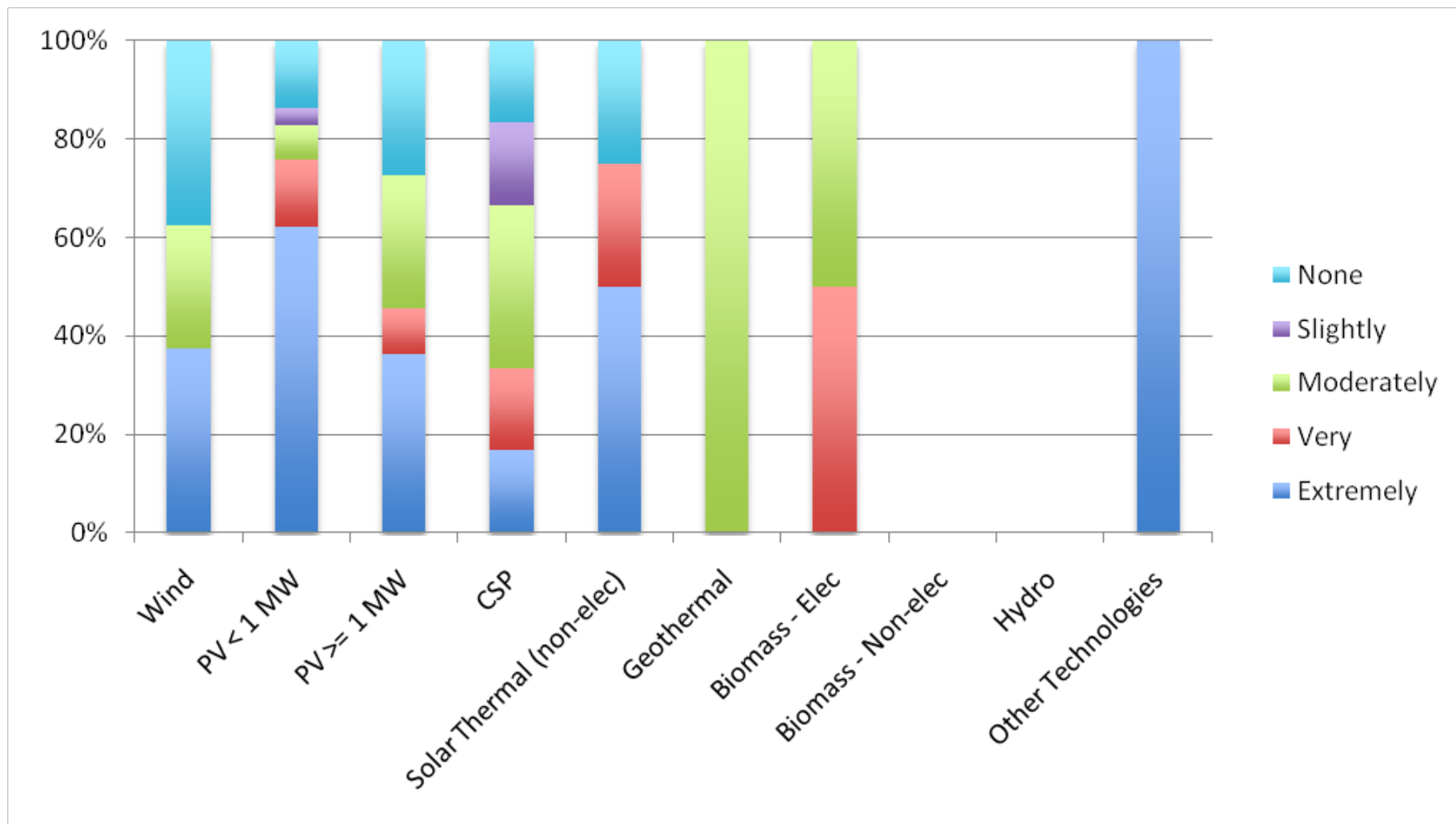
Comments

Importance of Treasury Grants



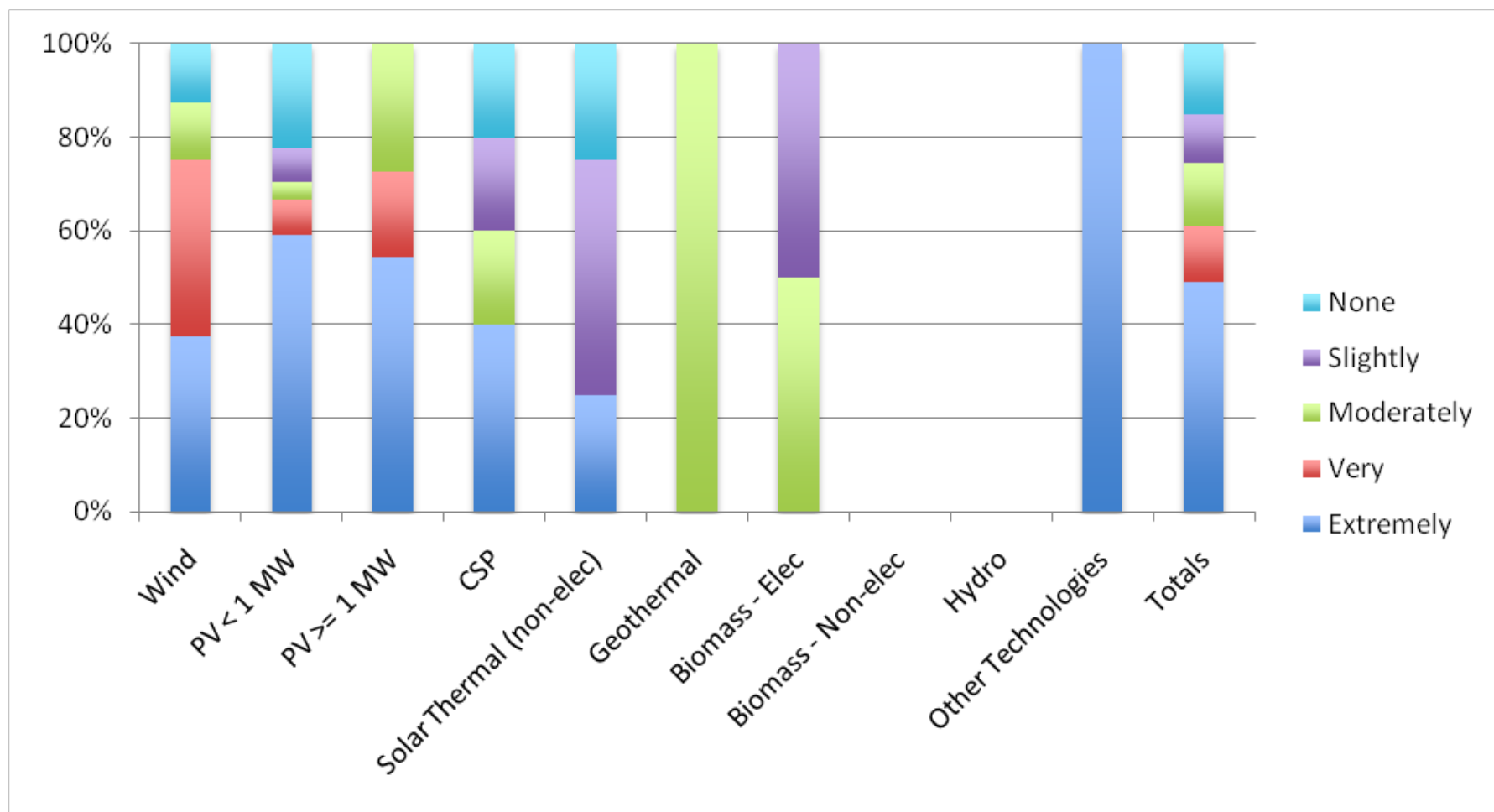
Scaled to 100%. Treasury Grants continue to be considered of extremely high importance, although (% difference from Q1)

Importance of State Incentives



Scaled to 100%. Not critical for CSP or geothermal. Important for small PV

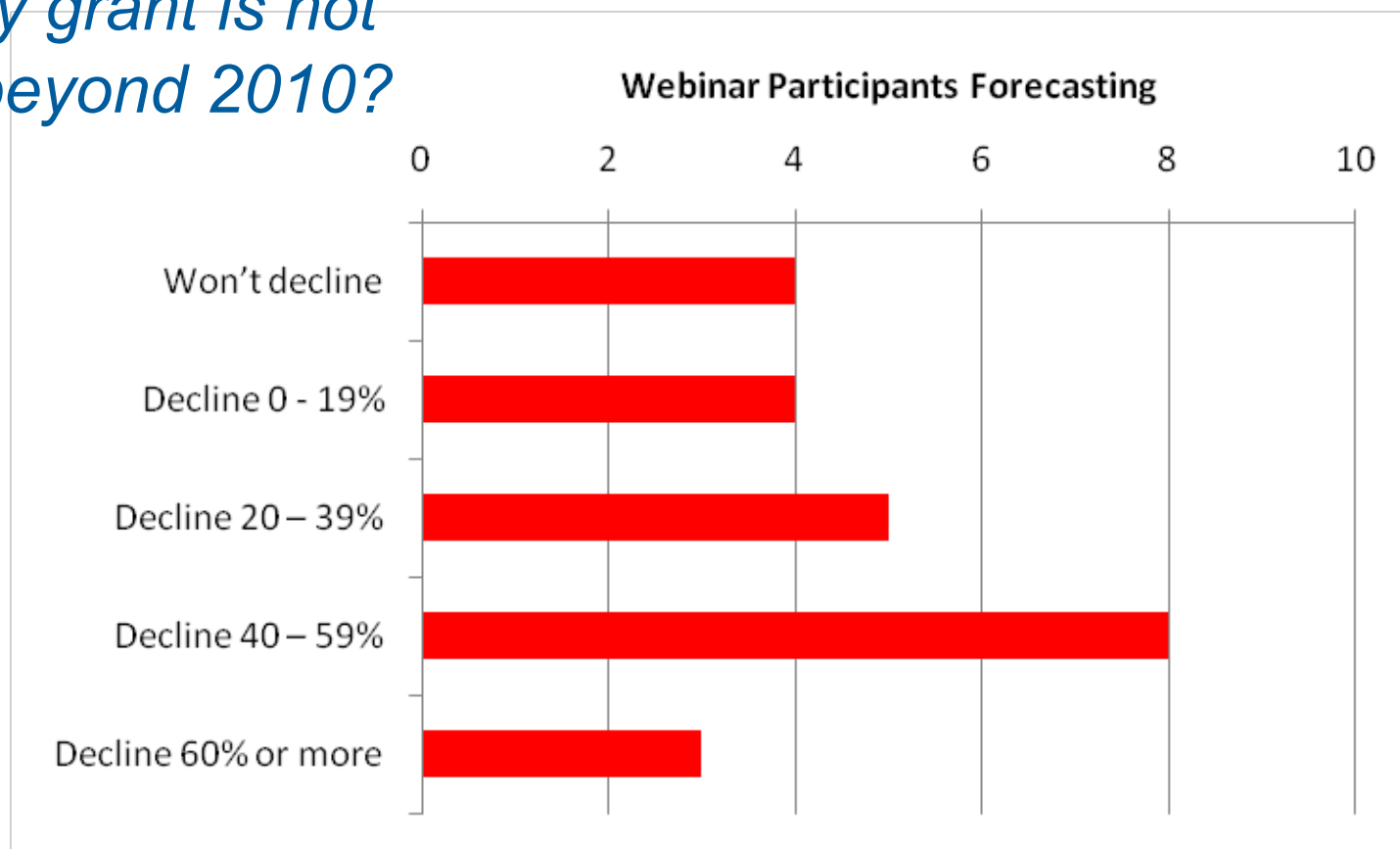
Importance of Portfolio Standards



Scaled to 100%

Interactive Poll #1

How much do you expect your business to change if the treasury grant is not extended beyond 2010?



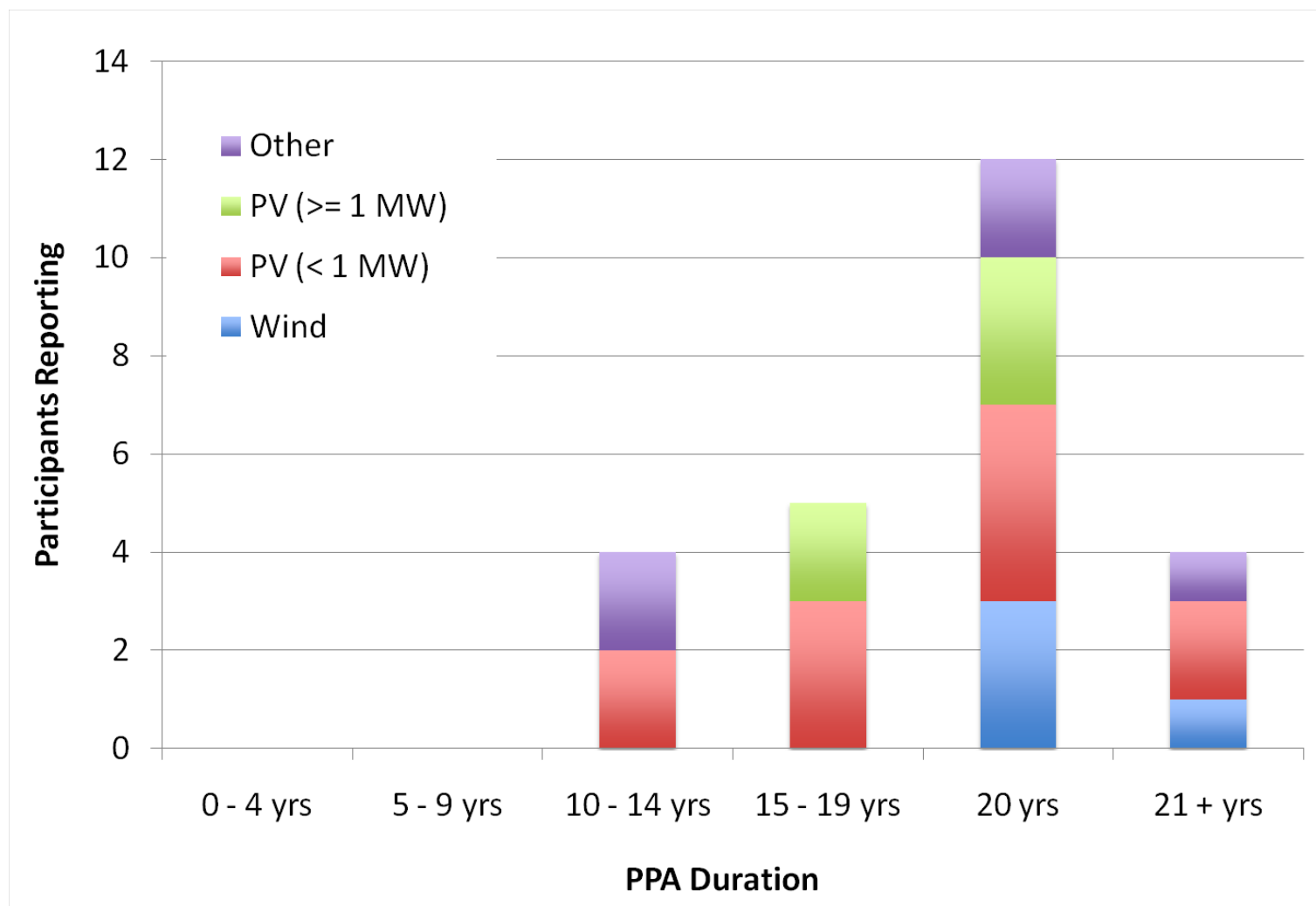
REFTI Questionnaire: Page 3, Q4 (Q10)

4. Please provide the following parameters to the typical Power Purchase Agreement (PPA) used in prior quarter...

| | PPA Term (yrs) | PPA Price in Yr 1 | PPA Price Escalation (%) | Customer Buyout Option |
|--------------------------|----------------------|----------------------|--------------------------|------------------------|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

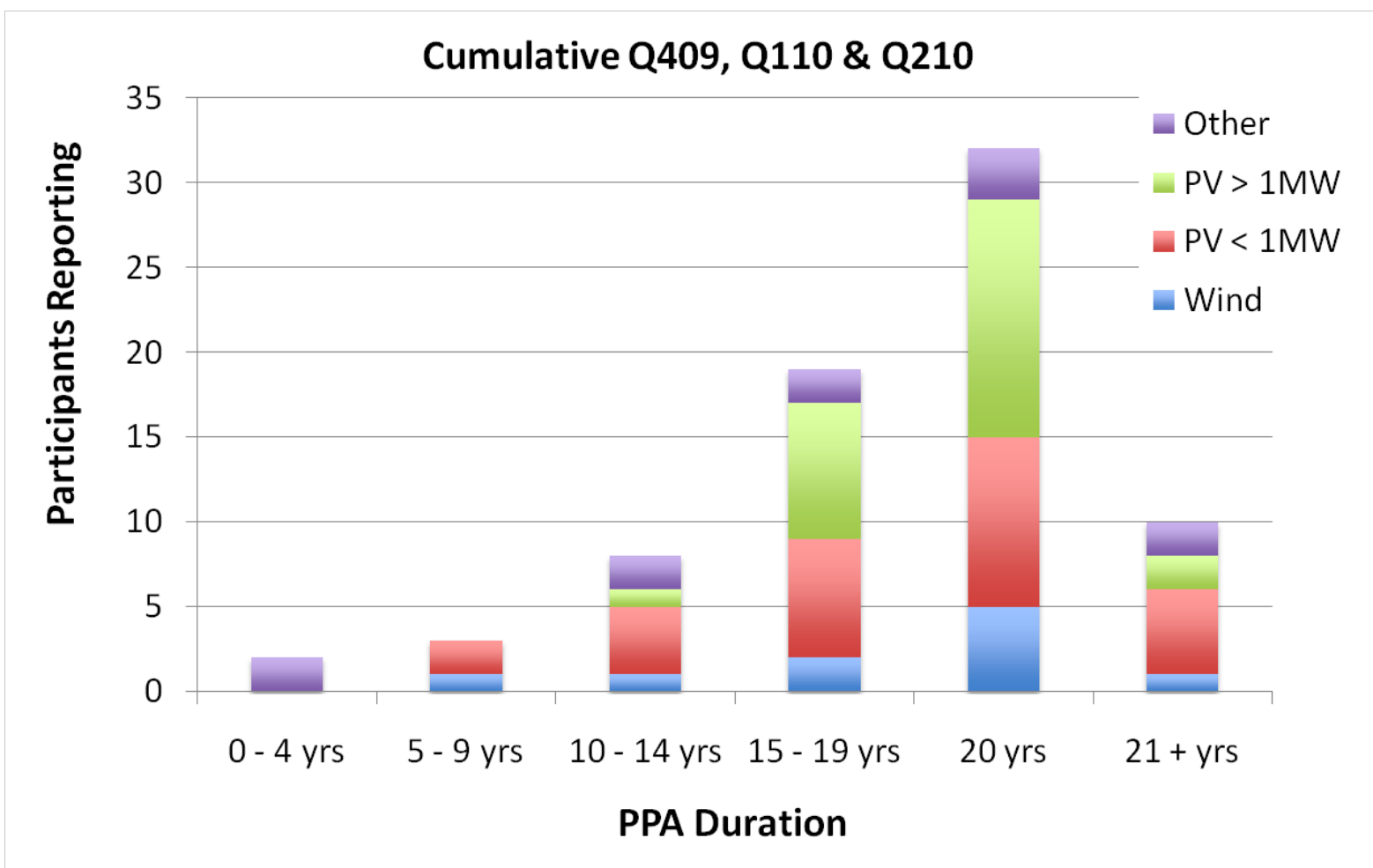
Comments

Typical PPA Duration

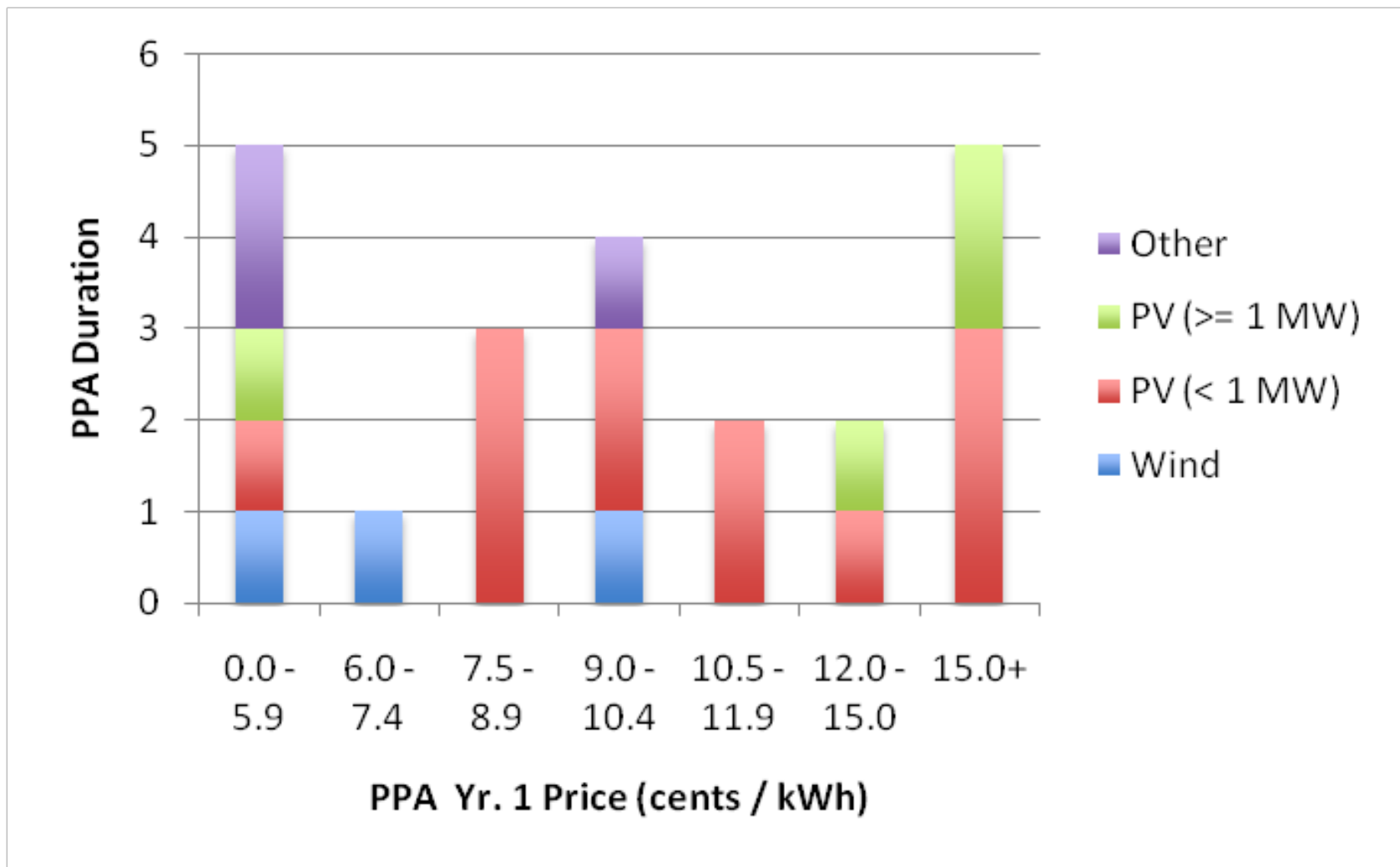


Most typically 20 year, all over 10 years

Typical PPA Duration – Cumulative

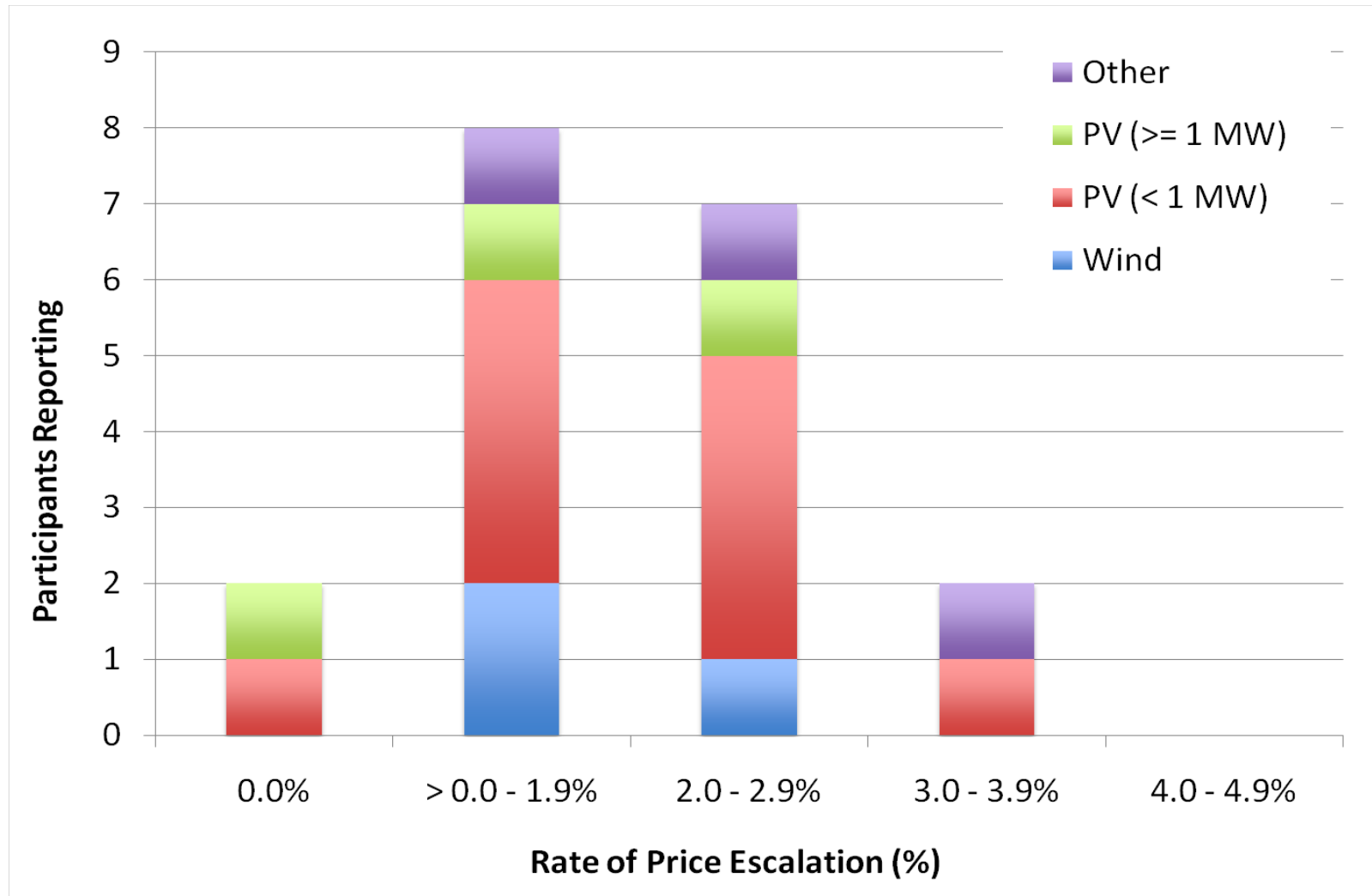


PPA Price - Year 1



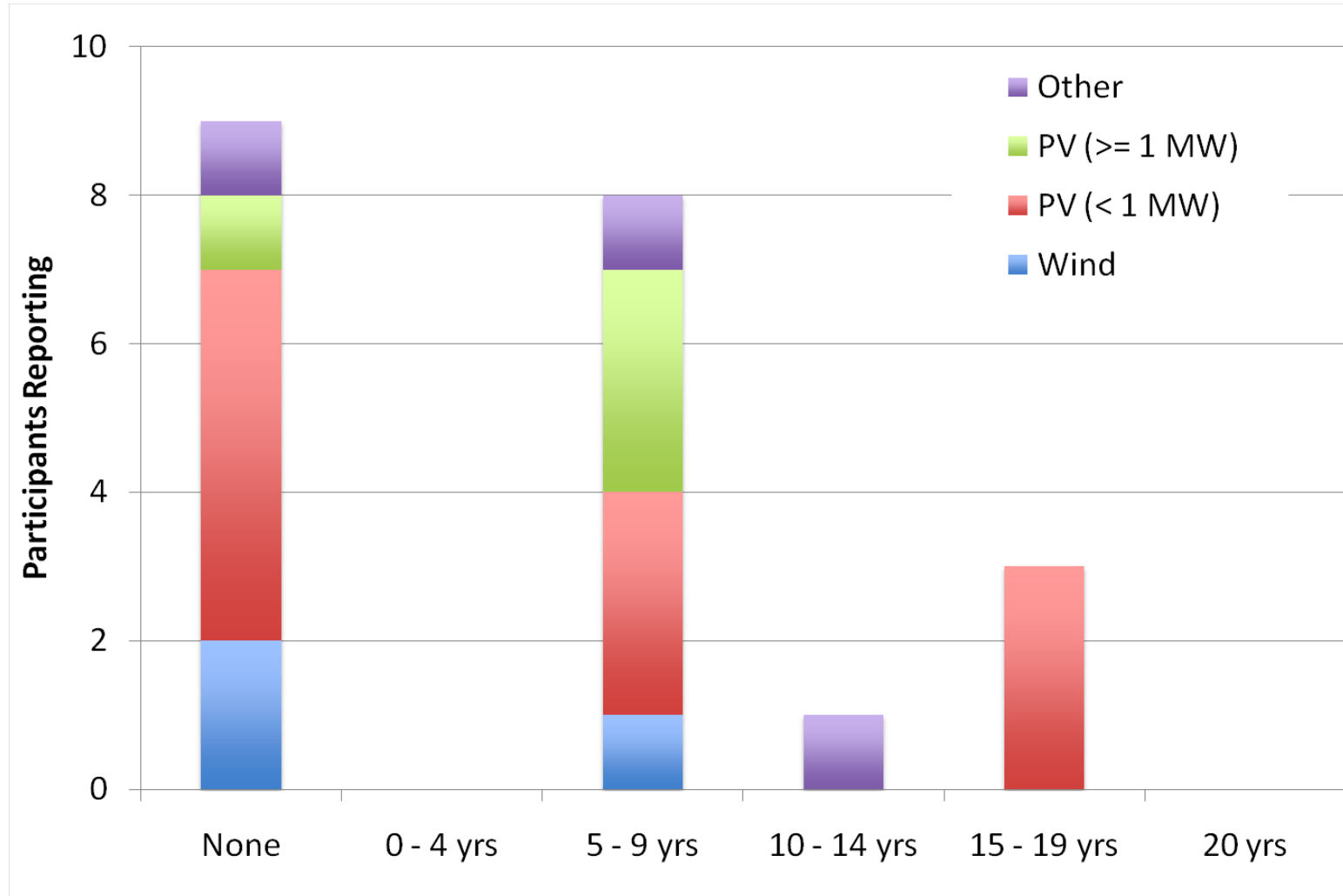
PPA prices likely highly dependent on resource, state-specific incentives, and prevailing utility rates

PPA Price Escalation



Most PPA contracts escalate at some rate, usually at less than 3%

PPA Customer Buyout Option



Slightly more than half of respondents indicate no customer buyout is available, remainder say buyout most commonly at 5-9 yrs

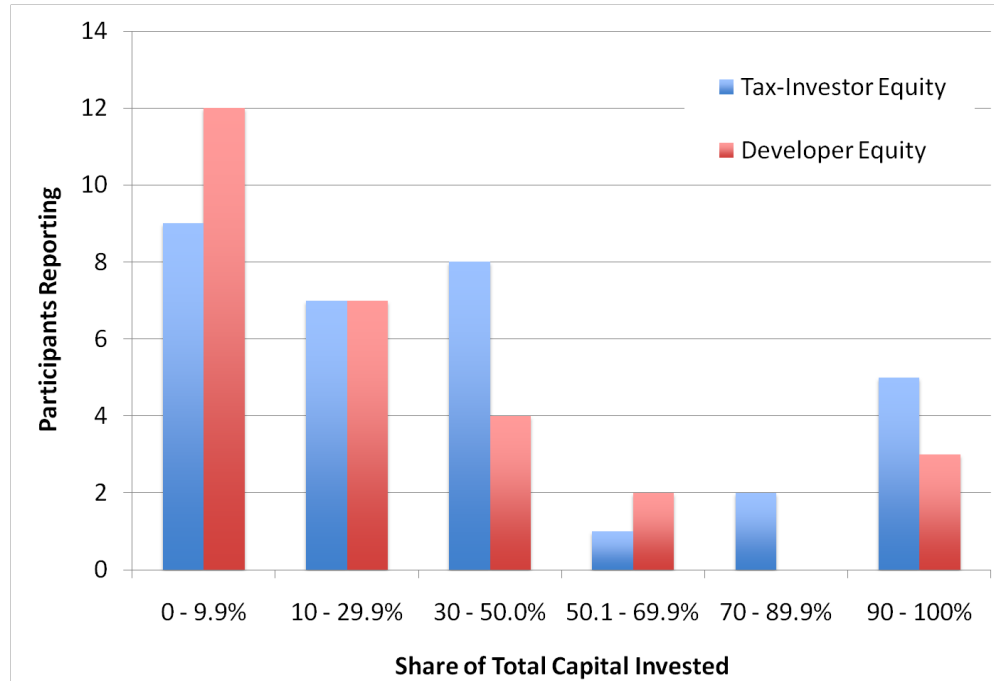
REFTI Questionnaire: Page 3, Q5 (Q11)

5. Regarding project **EQUITY CAPITAL** (based on after-tax returns), please tell us how your projects are generally structured...

| | Ratio of Tax-Investor Equity / Total Capital | Expected Return on Tax- Investor Equity | Ratio of Developer Equity / Total Capital | Expected Return on Developer Equity |
|--------------------------|---|--|--|--|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

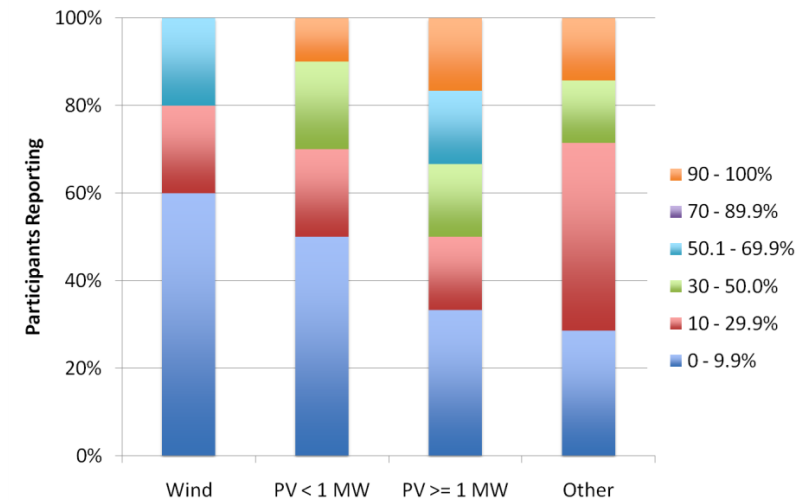
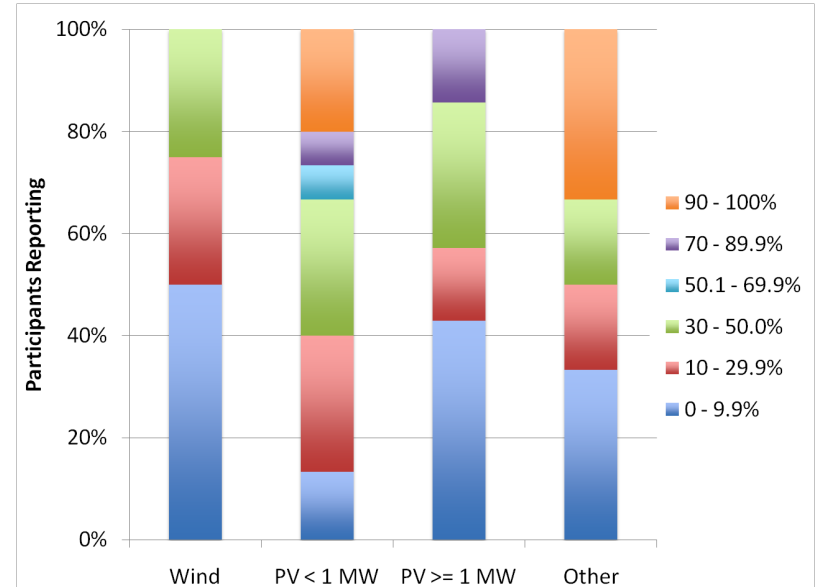
Comments

Equity Ratios



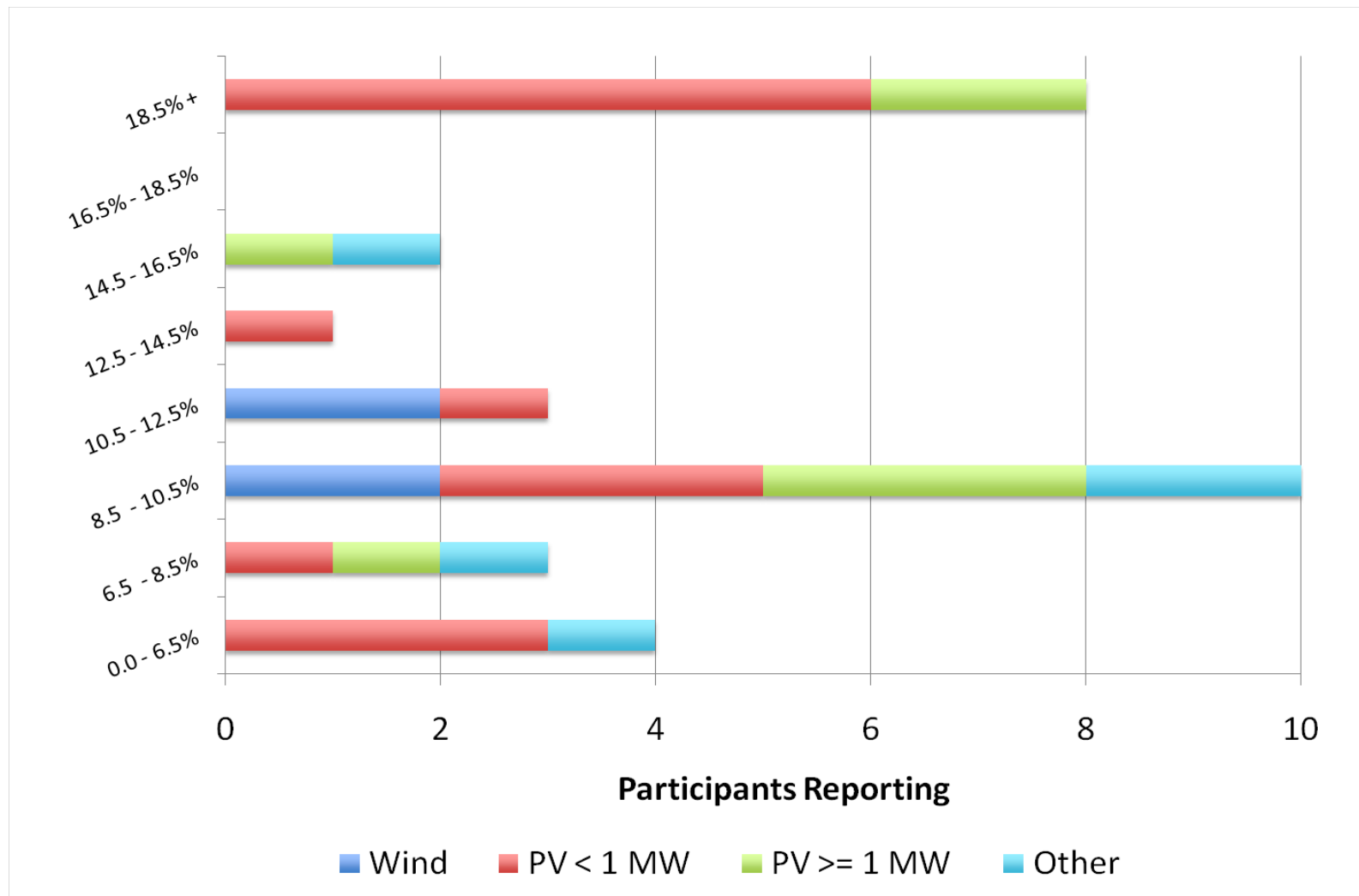
Tax and Developer equity each less than 50% of total capital. TE for small PV represents high % of total capex

Tax Equity



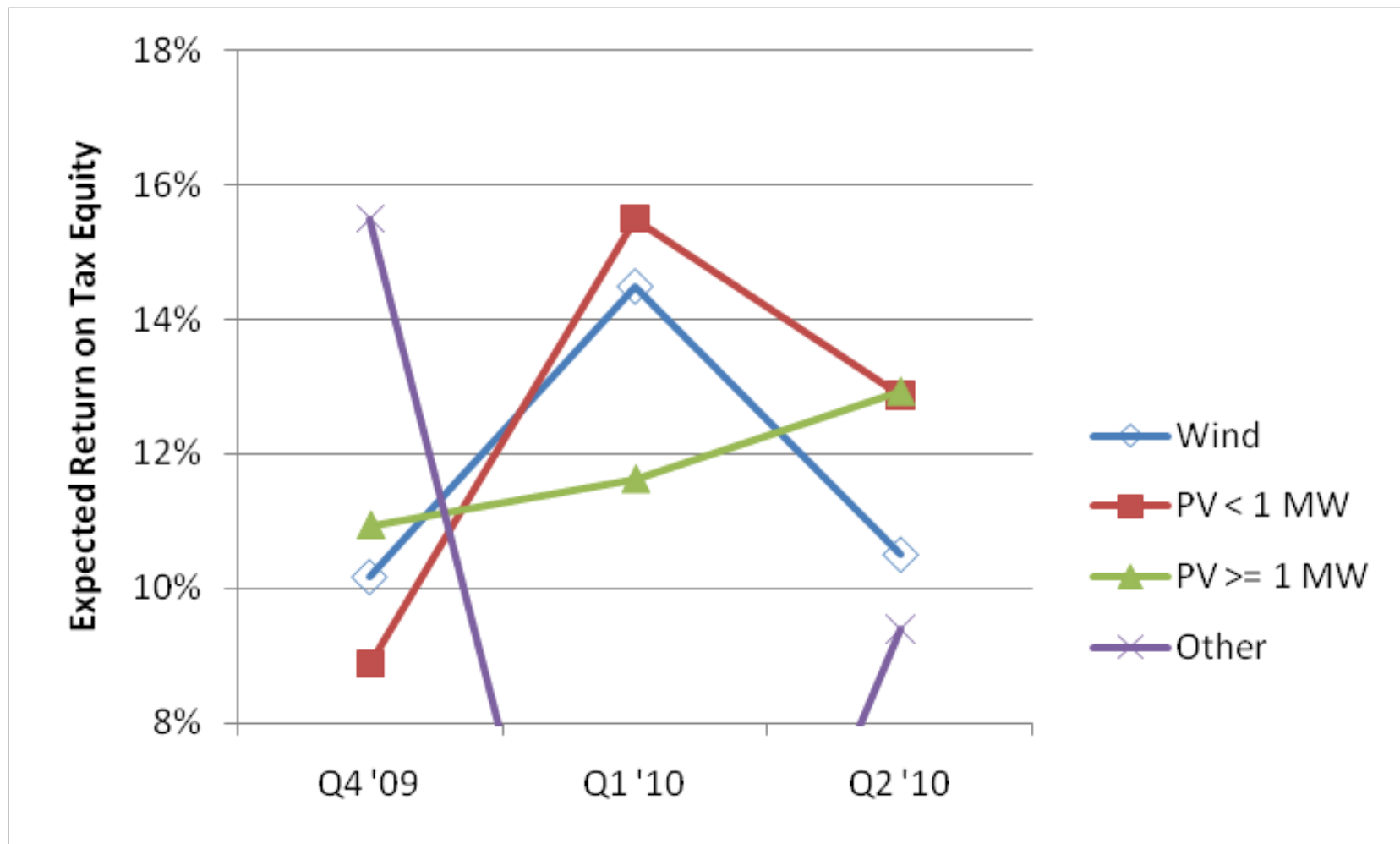
Dev. Equity

Expected Return on Tax-Investor Equity



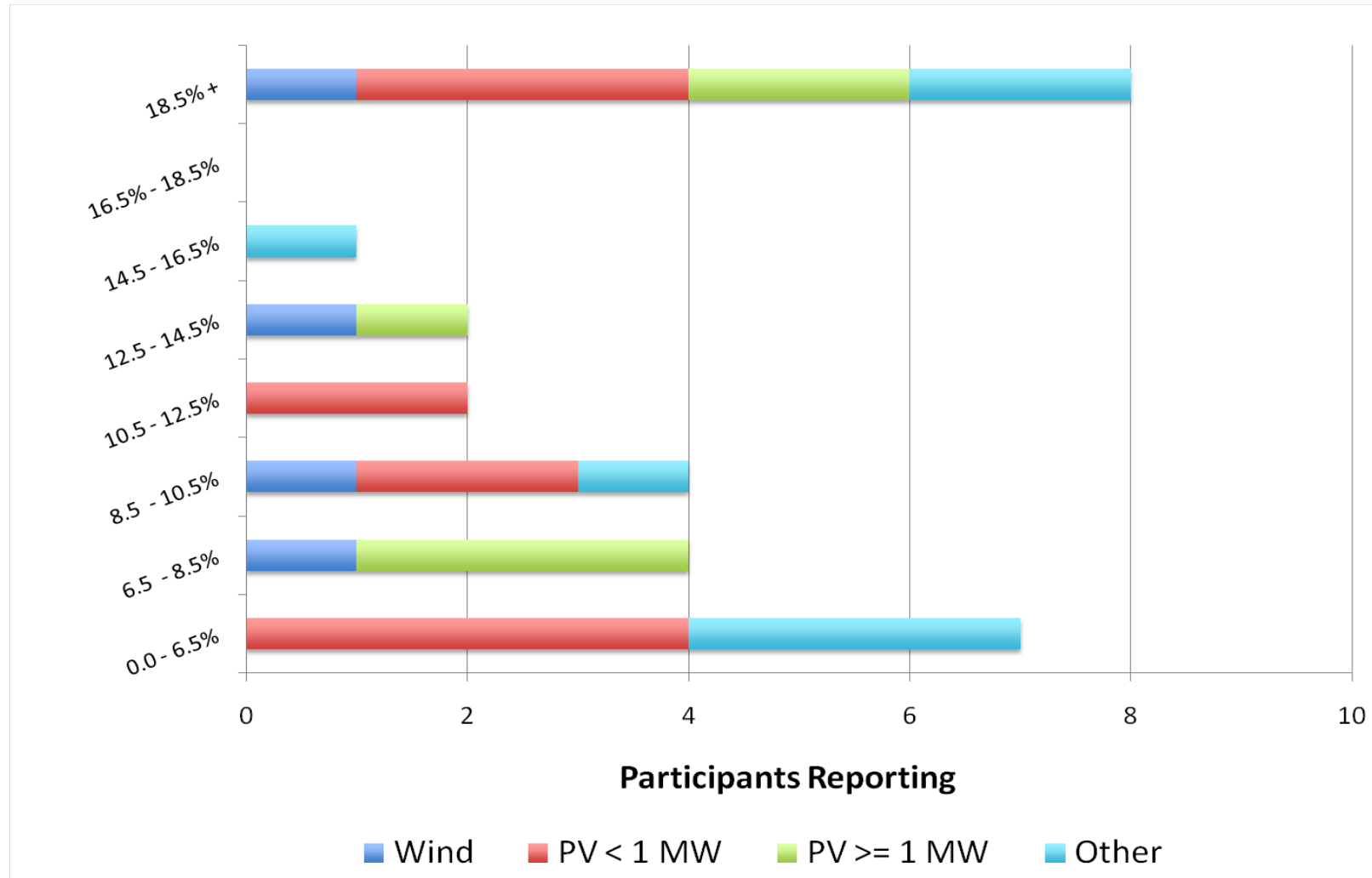
Tight bandwidth for wind projects. Much wider for PV, esp. small PV

Exp. Return on Tax Equity – Trend



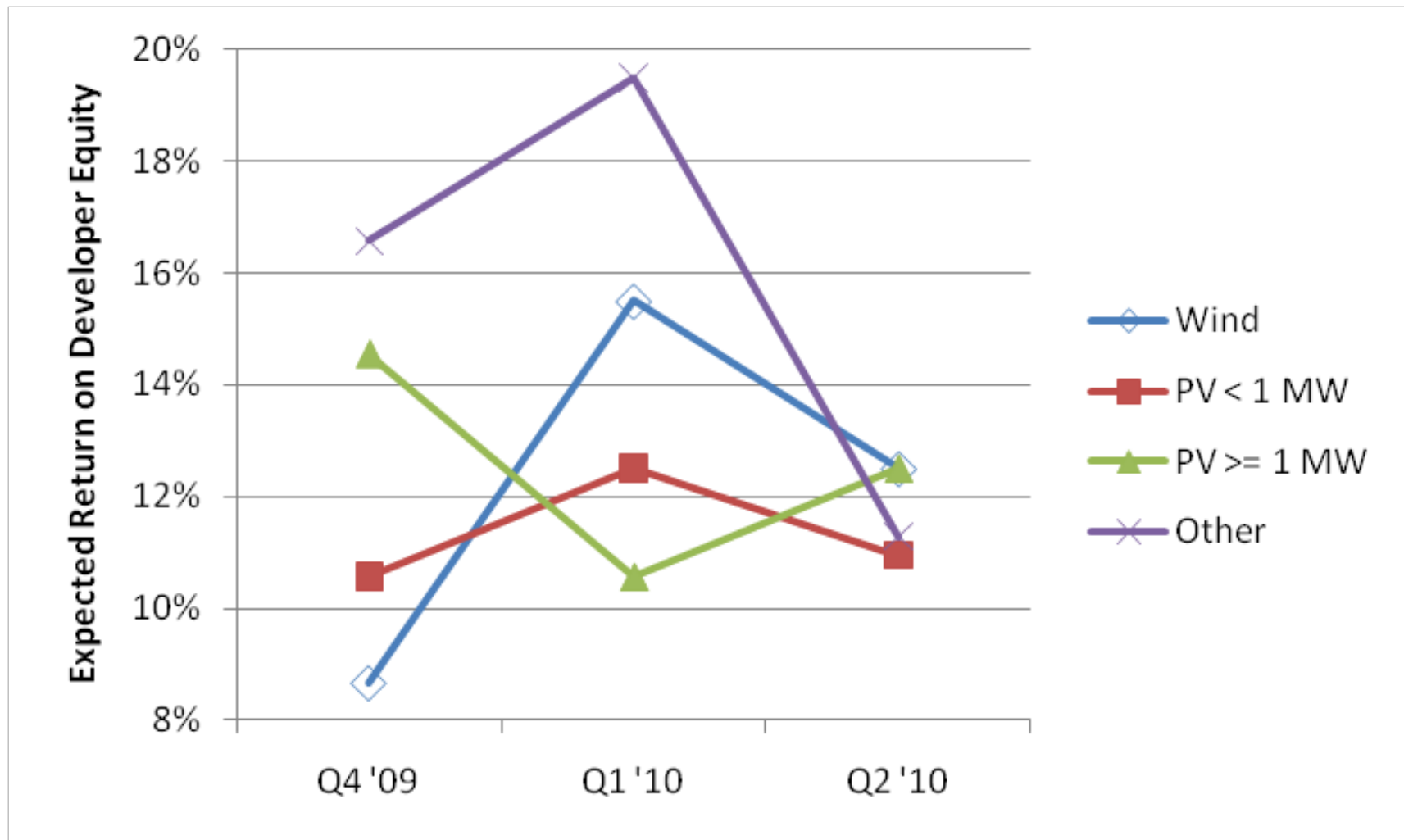
From Q4 '09 to Q2 '10, cost of tax equity appears to have increased in Q1 '10 and eased a bit in Q2 '10 (on wtd. avg. basis).

Expected Return on Developer Equity



Wide range of expected returns on developer equity – either very low or very high

Exp. Return on Developer Equity - Trend



Expected return on developer equity in Q1 '10 increased for wind projects, decreased for large PV. Both met at exact same point in Q2 '10

REFTI Questionnaire: Page 3, Q6 (Q12)

6. Regarding project-level **CONSTRUCTION** debt, please tell us how your projects are generally structured...

| | Source of Const. Debt | Ratio of Const. Debt / Total Capital | Average All-In Cost of Const. Debt (%) | Const. Debt Term (months) |
|------------------------------|-----------------------|---|---|------------------------------|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non- elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Comments

REFTI Questionnaire: Page 3, Q7 (Q13)

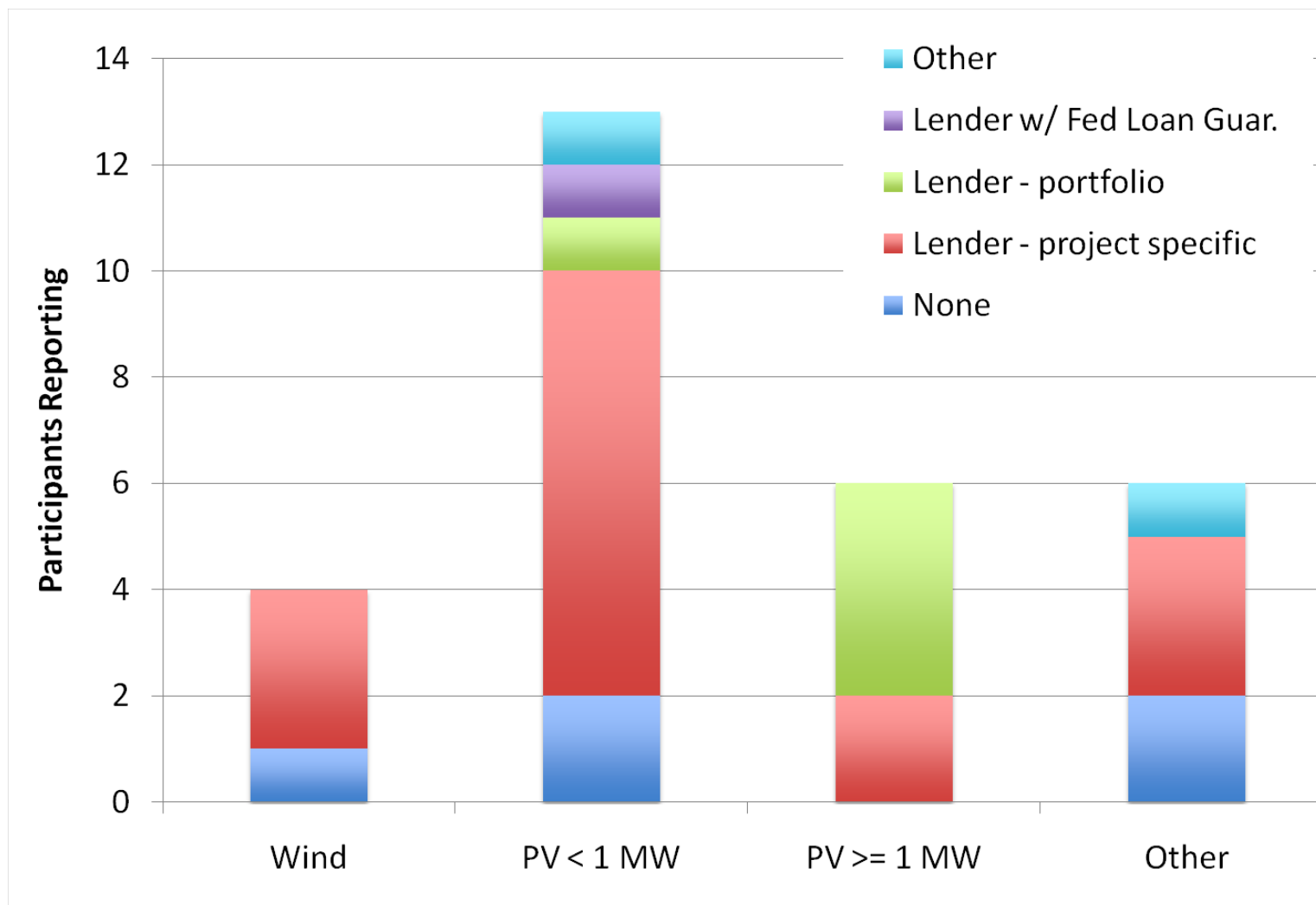
7. Regarding project-level TERM debt, please tell us how your projects are generally structured...

| | Source of Debt | Ratio of Debt / Total Capital | Ratio of Fed Loan Guarantee / Debt | Avg. All-In Cost of Debt (%) | Debt Term (yrs) | Avg. Debt Coverage Ratio Required |
|---------------------------------|----------------------|----------------------------------|---------------------------------------|---------------------------------|----------------------|---|
| Wind | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non -elec) | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Comments

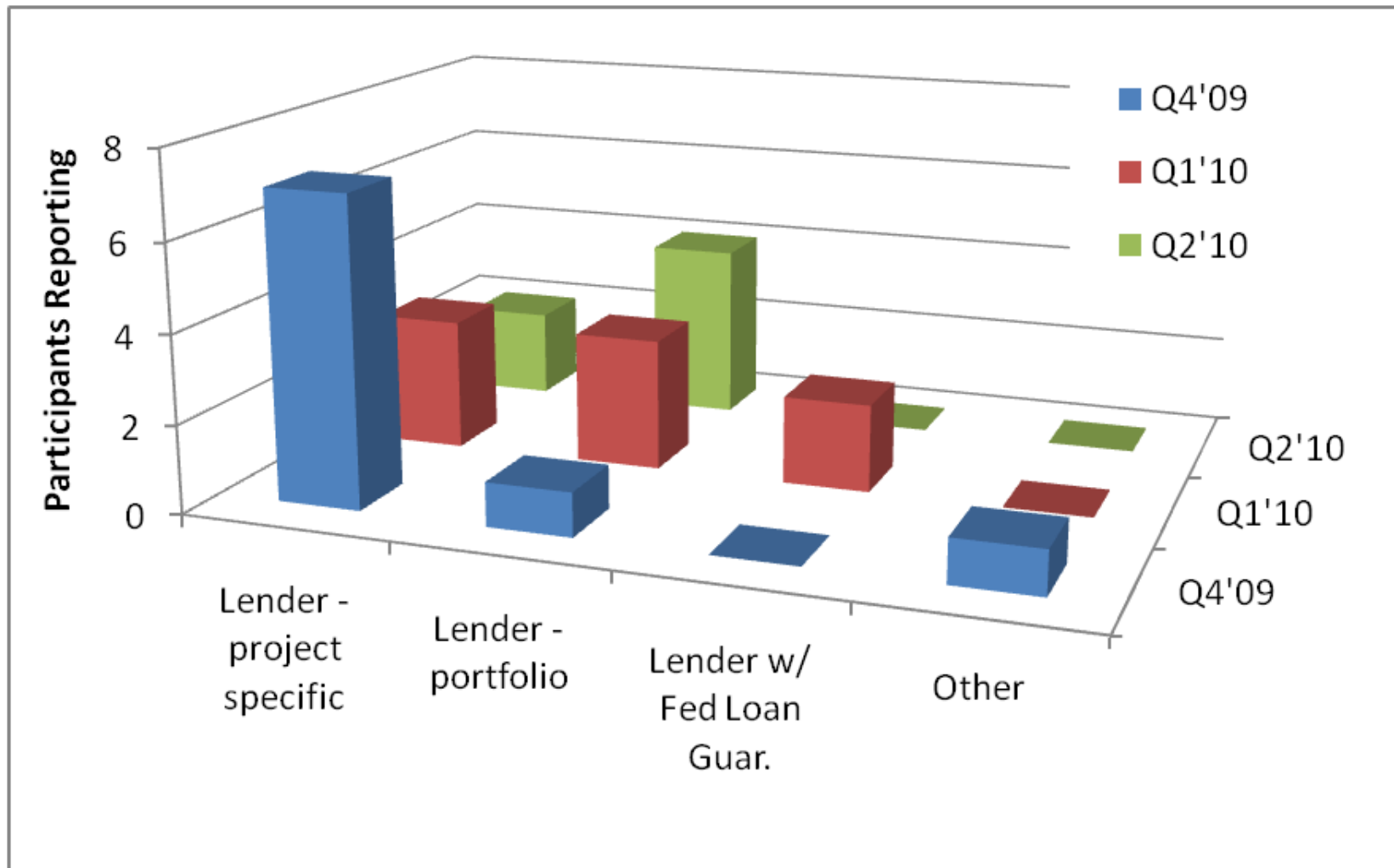


Source of Term Debt

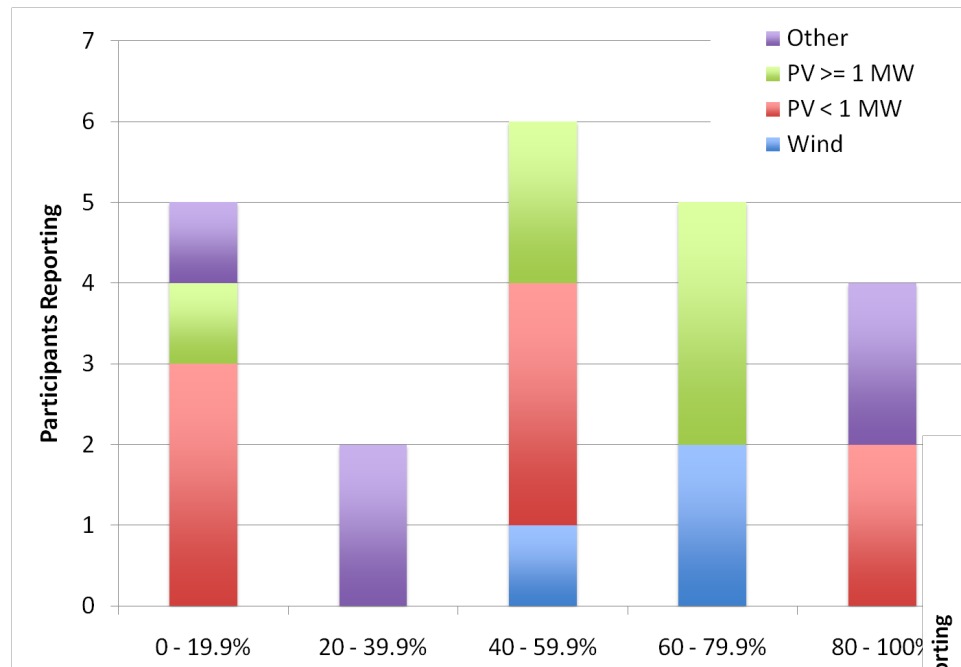


Project specific lending reported for projects less than 1 MW

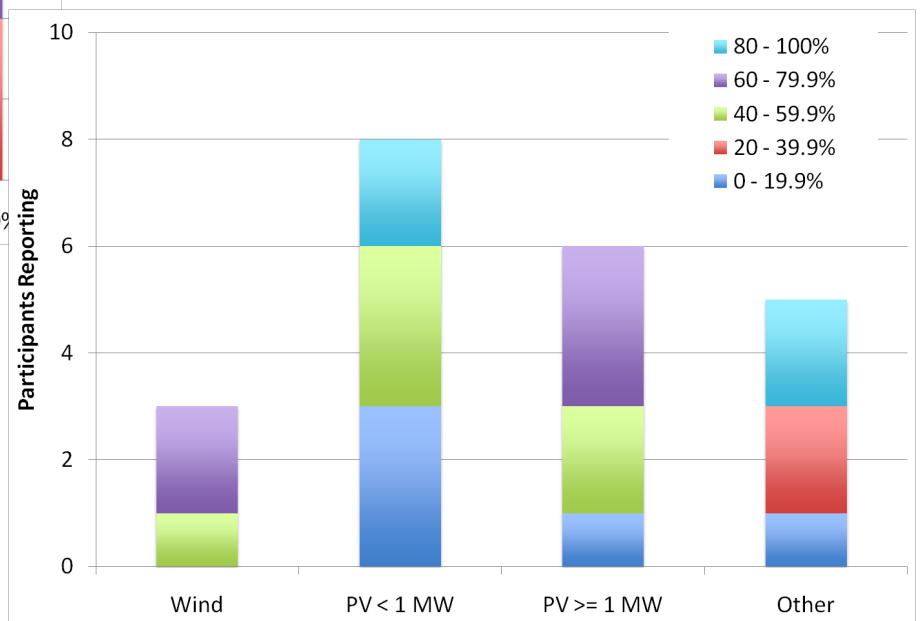
Source of Term Debt – Trend Analysis



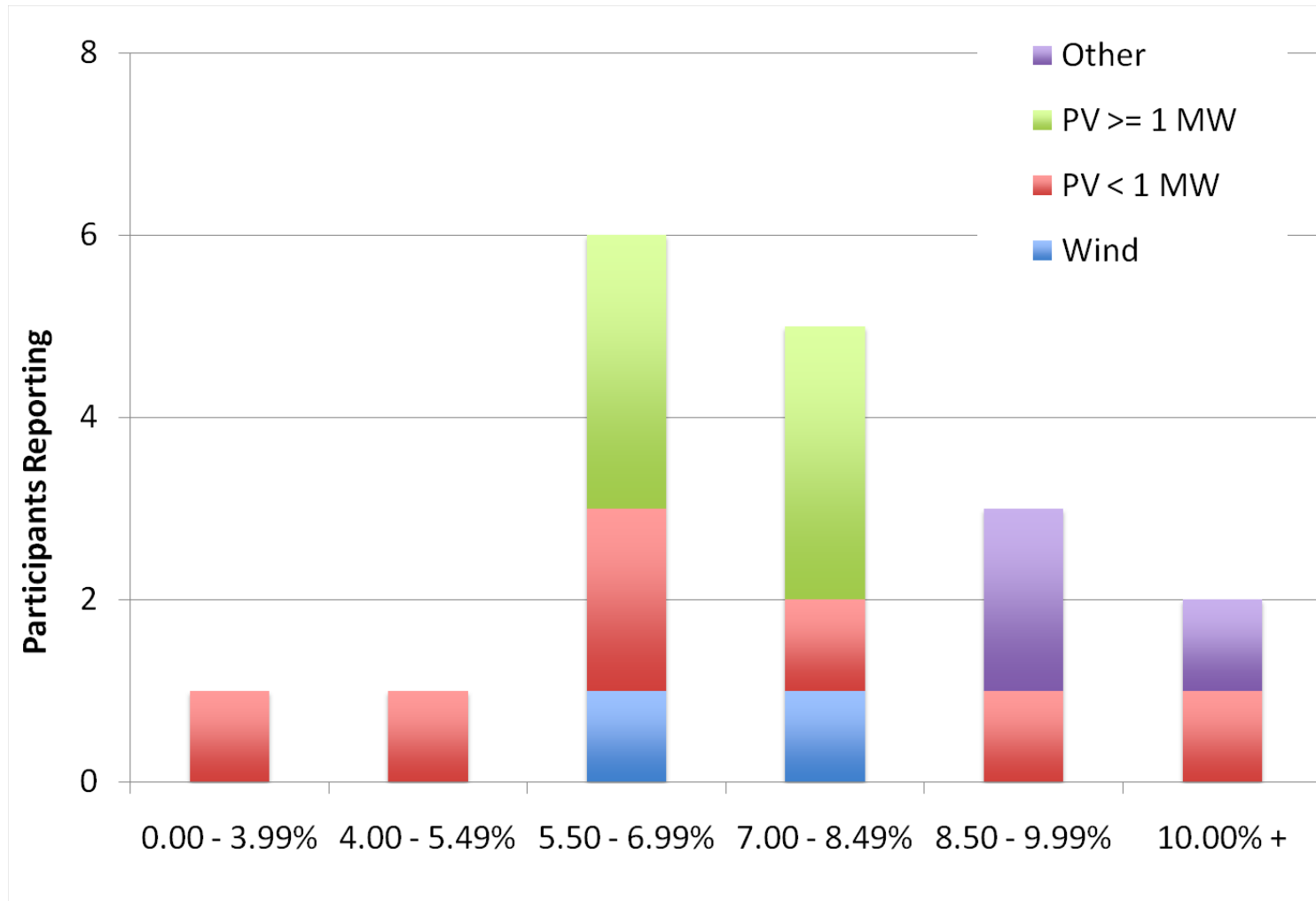
Term Debt as % of Total CapEx



Wind projects able to take on more debt. Small PV ranges from <20% to >80%.



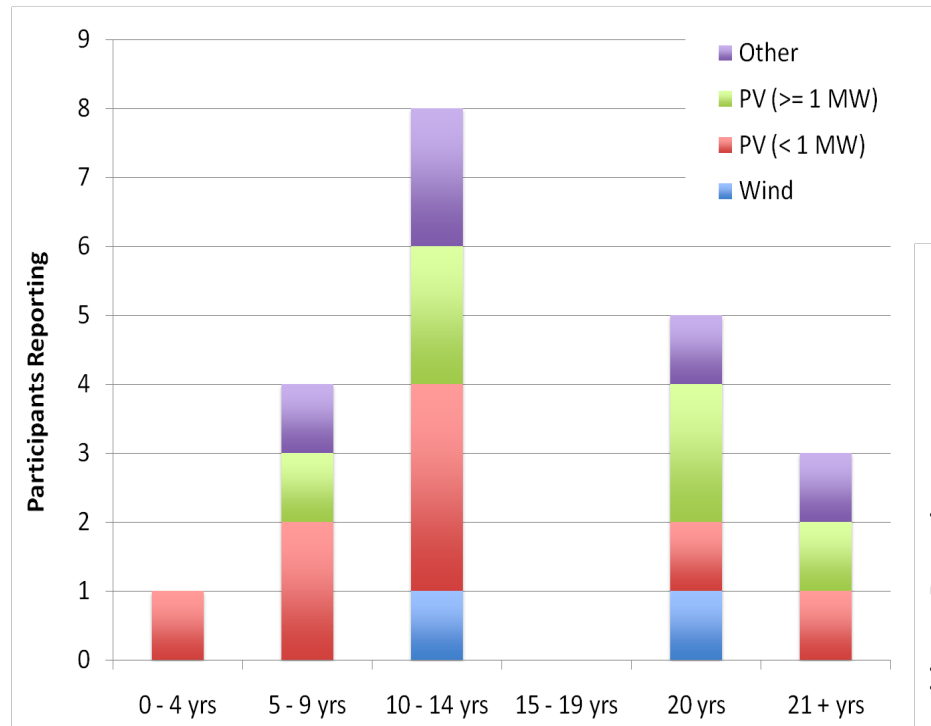
Cost of Term Debt (all-in)



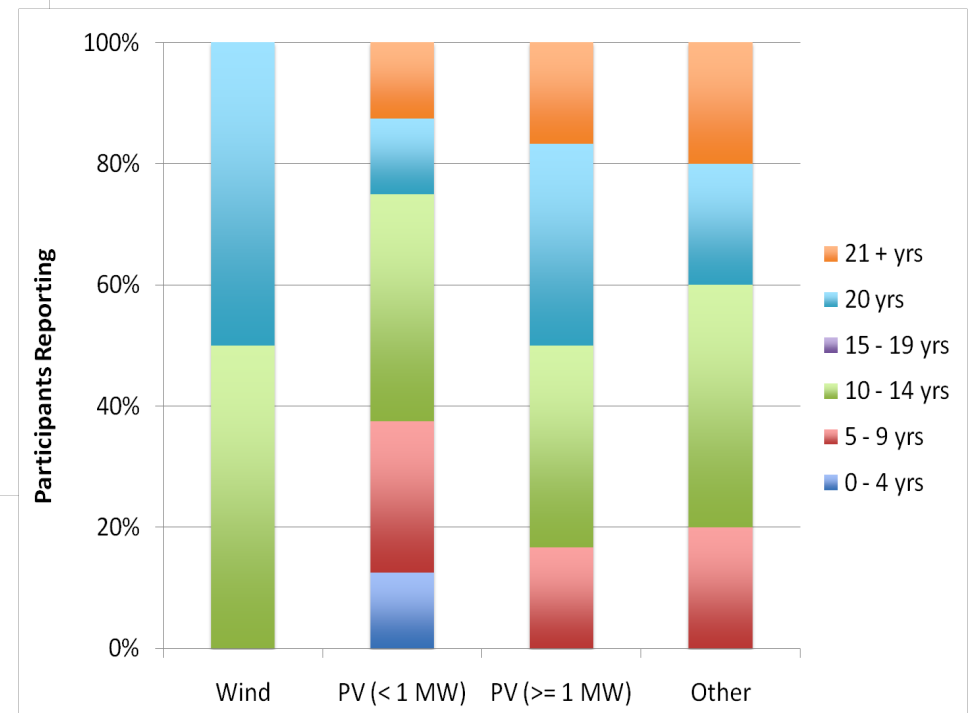
Most commonly in the 5.5 – 8.5% range. But REFTI participants reporting very wide range.

Term Debt Duration

by bin range

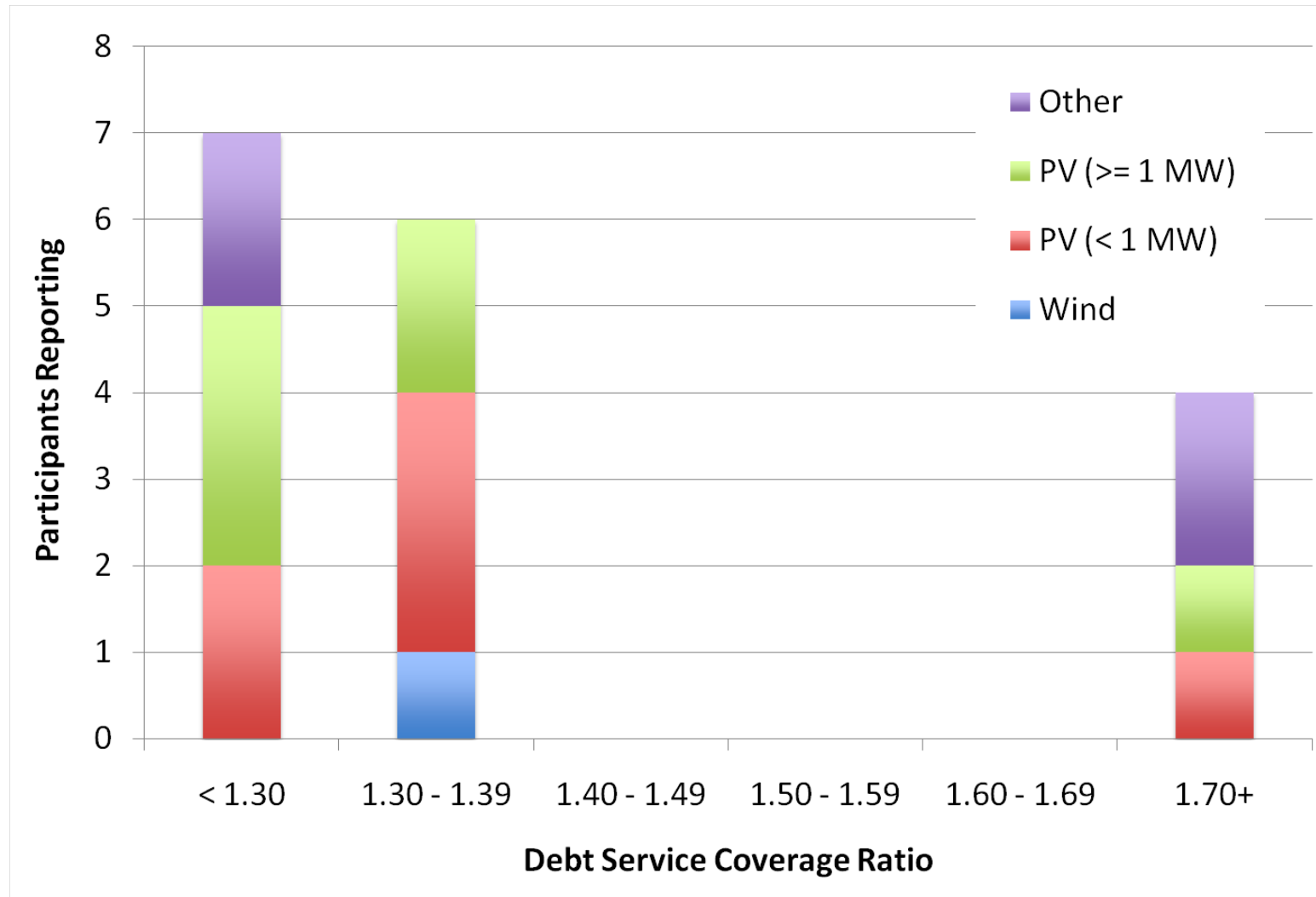


by technology, scaled to 100%



Small and large PV and other technology acquiring very short term debt

Debt Service Coverage Ratios Required



Min debt coverage ratios most commonly below 1.3x

REFTI Questionnaire: Page 3, Q8 (Q14)

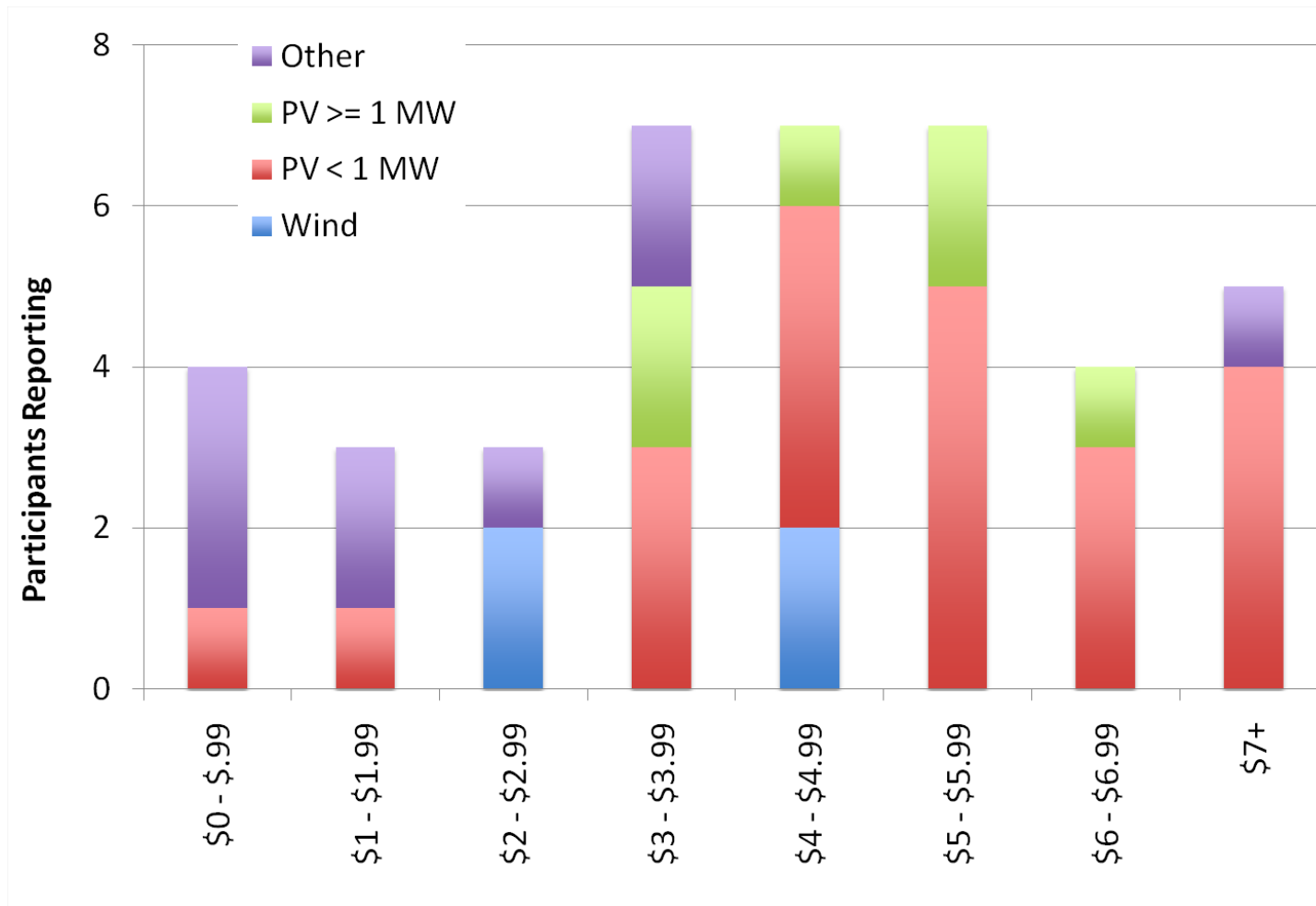
8. Provide the average **INSTALLED COSTS** (before incentives) and **LEVELIZED COST OF ENERGY (LCOE)** (after incentives) from your projects

(LCOE is generally the present value of costs divided by the present value of energy delivered)

| | Installed Costs (\$ / Watt - net output) | LCOE (cents / kWh) |
|--------------------------|--|----------------------|
| Wind | <input type="text"/> | <input type="text"/> |
| Solar - PV (< 1 MW) | <input type="text"/> | <input type="text"/> |
| Solar - PV (>= 1 MW) | <input type="text"/> | <input type="text"/> |
| Solar - CSP | <input type="text"/> | <input type="text"/> |
| Solar Thermal (non-elec) | <input type="text"/> | <input type="text"/> |
| Geothermal | <input type="text"/> | <input type="text"/> |
| Biomass - Elec | <input type="text"/> | <input type="text"/> |
| Biomass - Non-elec | <input type="text"/> | <input type="text"/> |
| Hydro | <input type="text"/> | <input type="text"/> |
| Other Technologies | <input type="text"/> | <input type="text"/> |

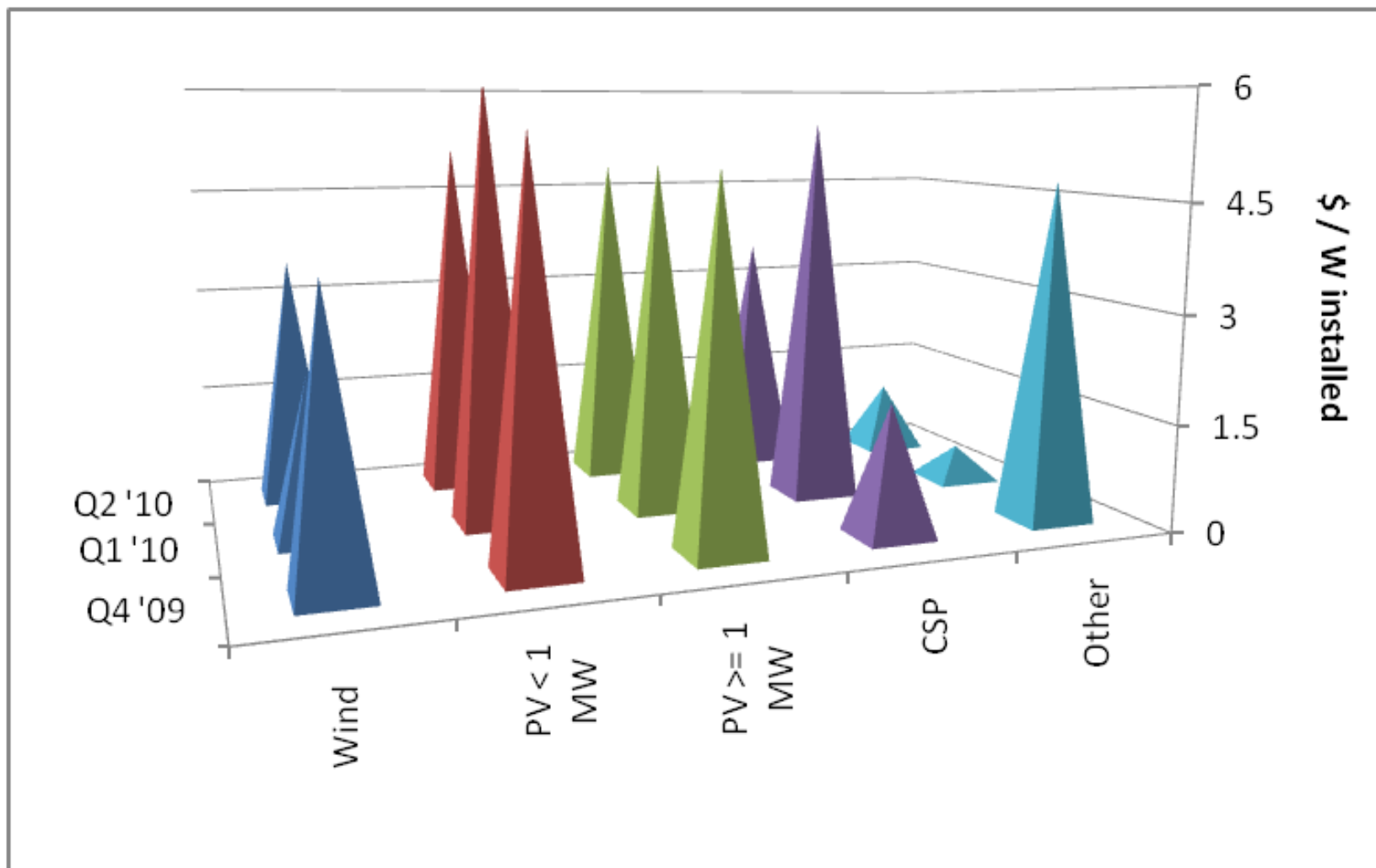
Comments

Installed Costs (before incentives)



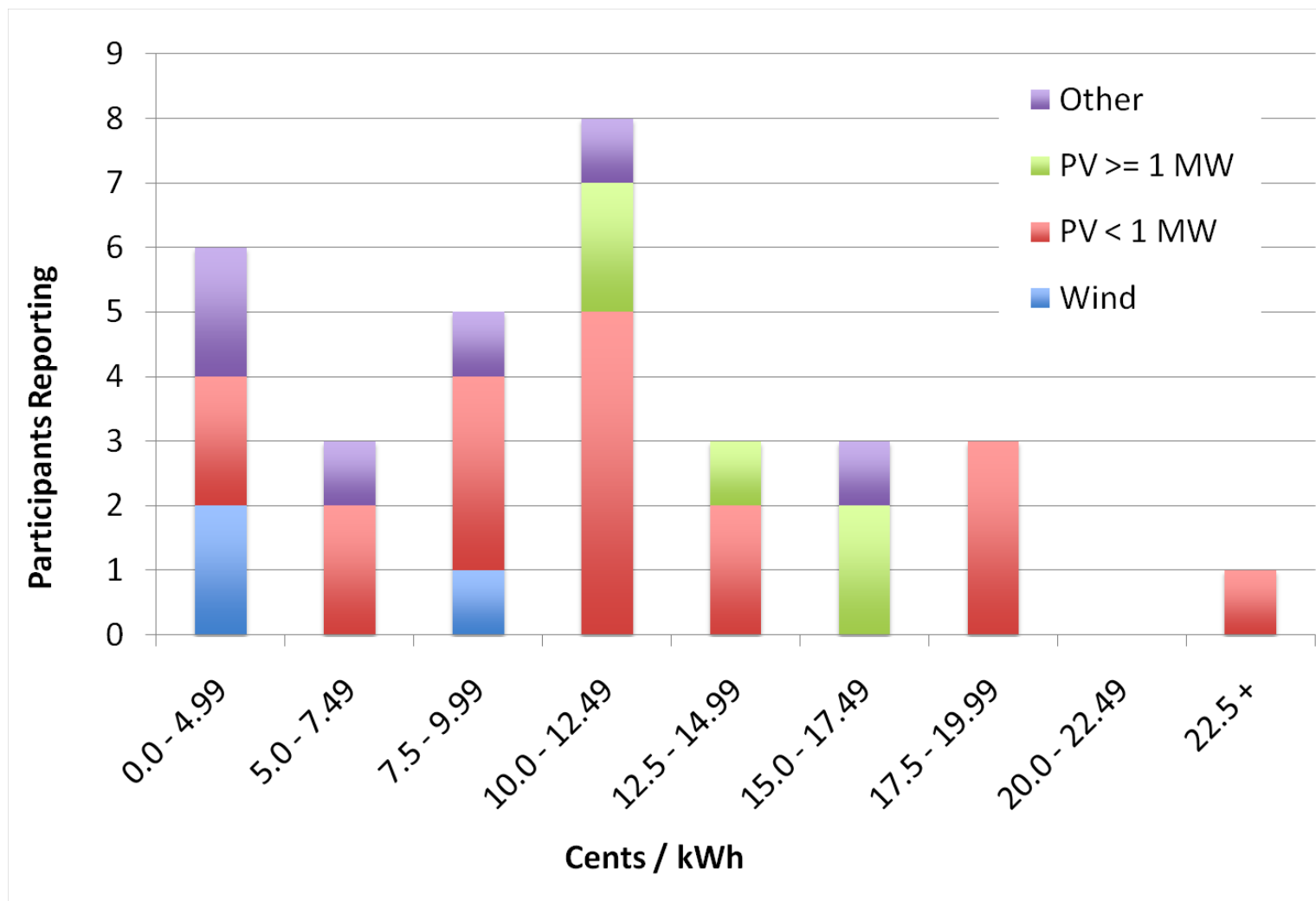
Very wide range for small PV reported. Less than \$1 /W installed?

Installed Costs – Trend Analysis (wtd. avg.)



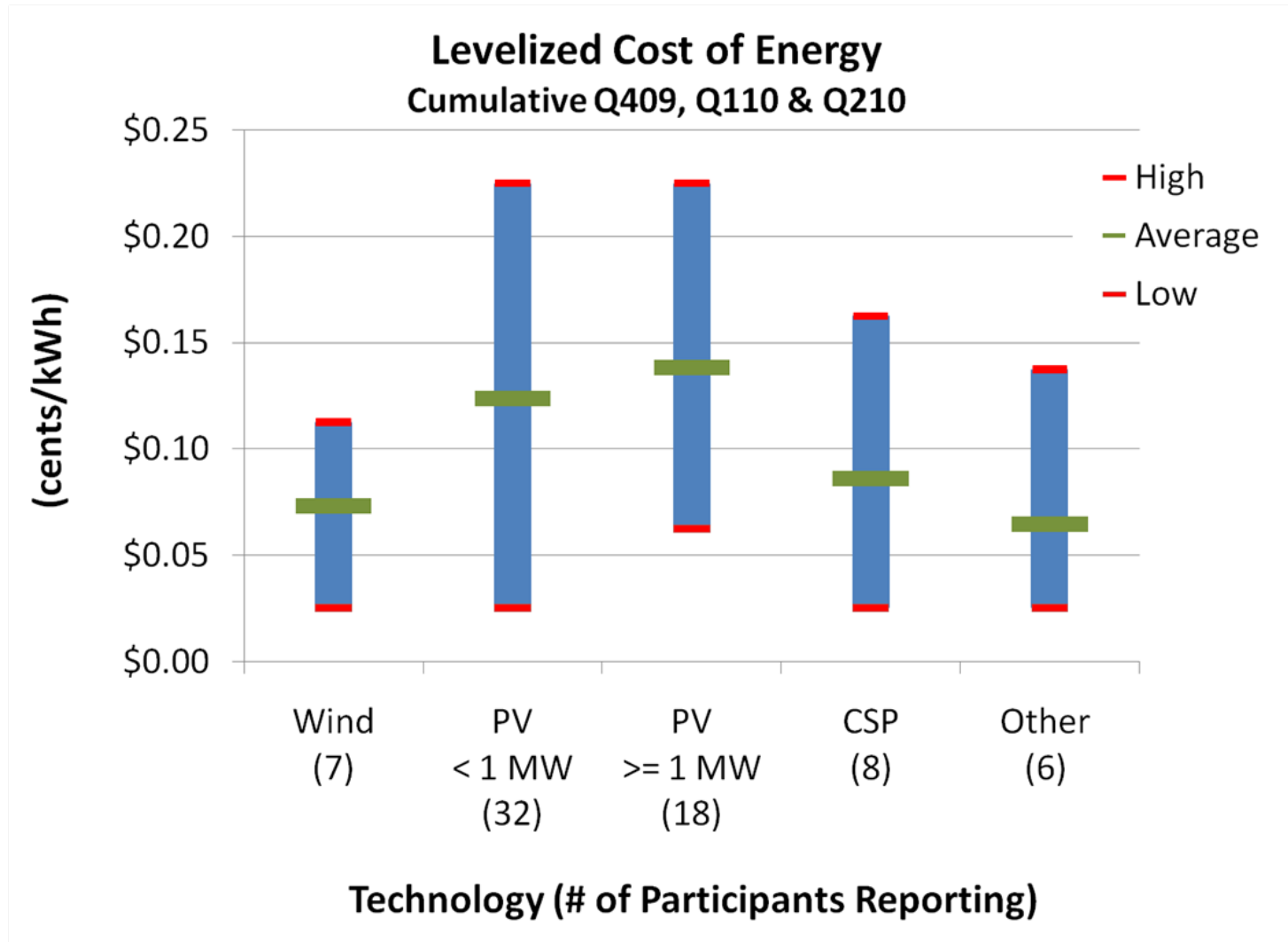
On a wtd. avg. basis, most techs hold relatively consistently across multiple quarters of REFTI data

Levelized Cost of Energy (cents/kWh)



Large PV within reasonable range 10 – 17.5 cents/kWh. Small PV reported in very wide range.

LCOE – Cumulative Range and Avg. (cents/kWh)



REFTI Questionnaire: Page 4, Bonus Q1

1. What was the transaction cost (as a % of total dollar value) to monetize tax equity and/or MACRS depreciation benefits?

TE Transaction Cost

Wind

Solar - PV (< 1 MW)

Solar - PV (\geq 1 MW)

Solar - CSP

Solar Thermal (non-elec)

Geothermal

Biomass - Elec

Biomass - Non-elec

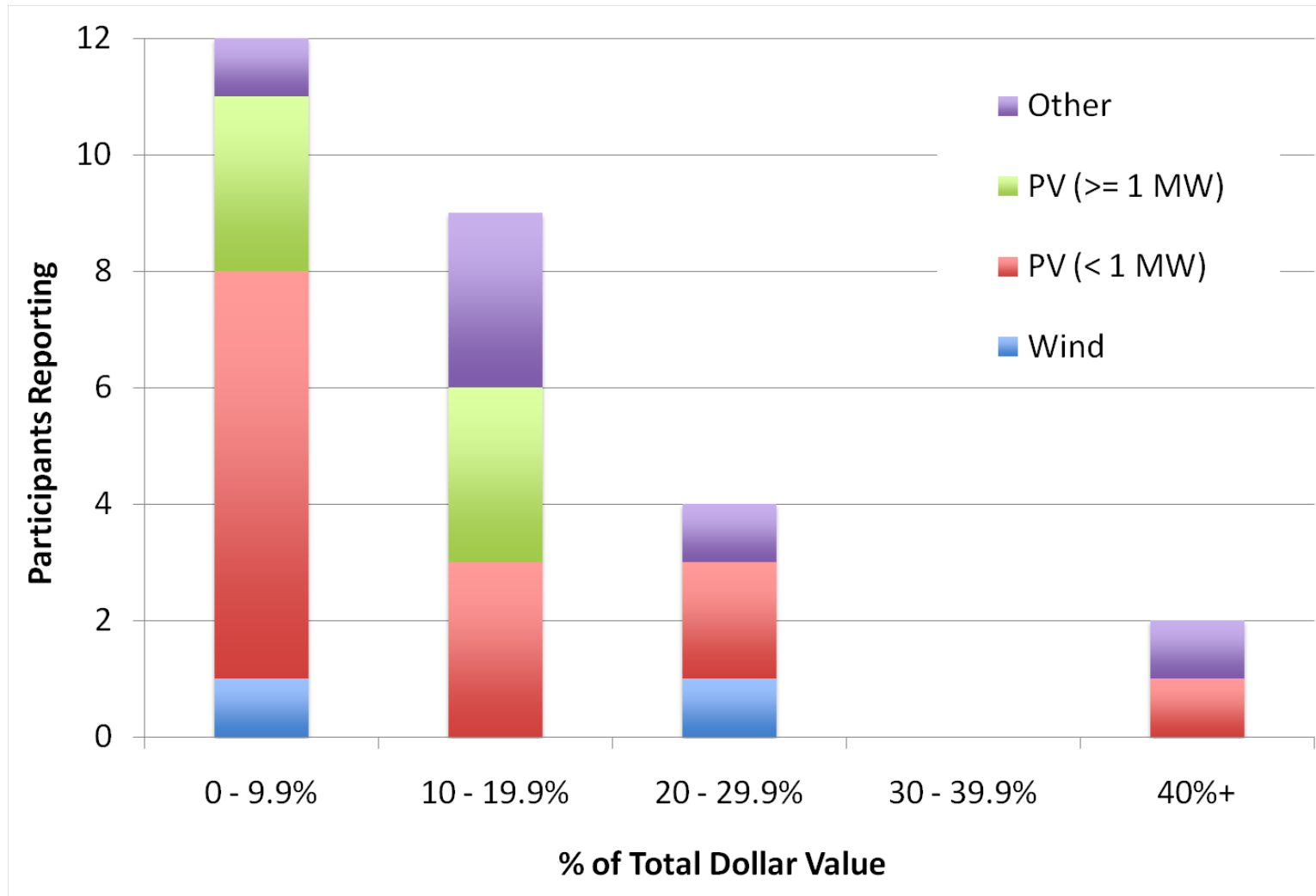
Hydro

Other Technologies

Comments



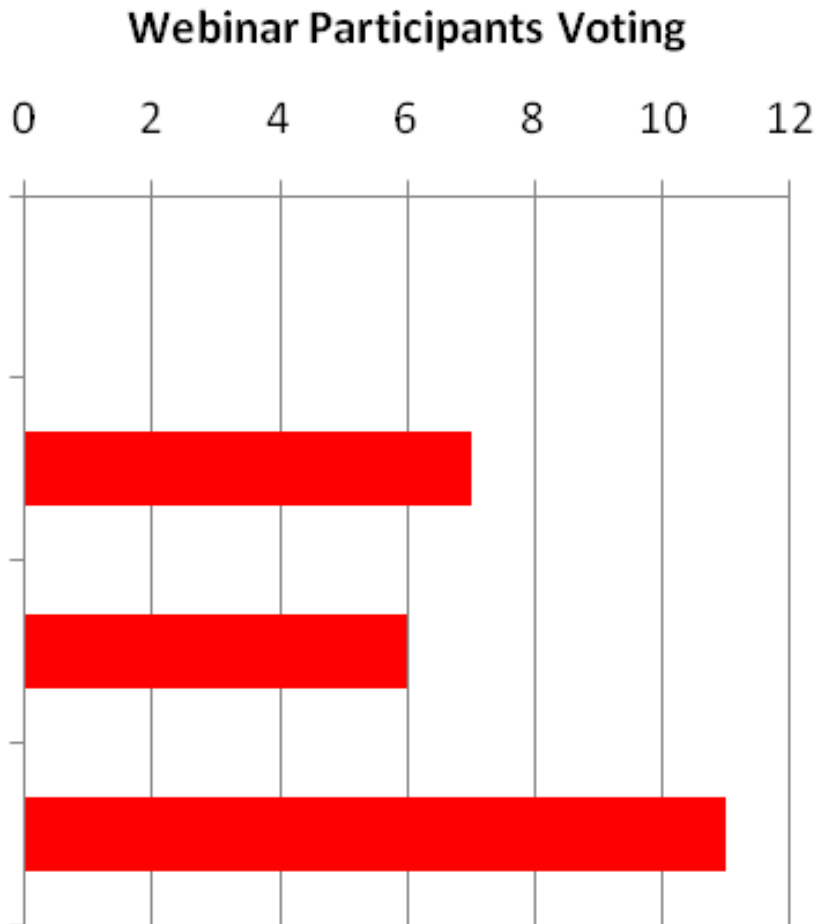
Transaction Cost as % of ITC / MACRS Benefit



Transaction cost primarily less than 20%. Some very high numbers reported

Interactive Poll #2

Should the Loan Guarantee program be:



Data Confidentiality

- Ensuring REFTI data confidentiality critical to NREL
- Data gathered through REFTI will only be utilized for:
 - *Providing aggregate values for model inputs*
 - *Reporting trends*
 - *Participant-specific data will not be utilized or distributed in any way*
- Non-disclosure agreements are available
 - *Executing an NDA is fully voluntary*
 - *3 – 12 month NDAs are available*
- Please let us know if you have any concerns over data provided through this webinar
 - *Slides will not be made available immediately to allow time to raise concerns*
- Q2 Survey still available for review only



Thank you!!!

We appreciate your participation!

Michael Mendelsohn

michael.mendelsohn@nrel.gov

303/384-7363

Current (Q3 2010) REFTI Questionnaire
available at:

<http://www.surveymonkey.com/s/K2ZXYJW>

